Summit County
Multi-Hazard Mitigation Plan

Comprehensive Update
August 2013

Summit County
Multi-Hazard Mitigation Plan

COMPREHENSIVE UPDATE

August 2013

Developed by Summit County with professional planning assistance from
AMEC Environment and Infrastructure
Hazard Mitigation and Emergency Management Program
Boulder, Colorado

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

Executive Summary ..... **vi**

Chapters

1 Introduction and Planning Area Profile **1.1**

1.1 Purpose **1.1**
1.2 Background and Scope **1.1**
1.3 Jurisdictional Annexes **1.3**
1.4 Plan Organization **1.3**
1.5 Planning Area Profile **1.4**
1.5.1 Geography and Climate 1.6
1.5.2 Population 1.6
1.5.3 History 1.8
1.5.4 Economy 1.8

2 Planning Process **2.1**

2.1 Background on Mitigation Planning in Summit County **2.1**
2.2 Plan Section Review and Analysis – 2013 Update **2.1**
2.3 Multi-Jurisdictional Participation **2.4**
2.4 The 10-Step Planning Process **2.5**

3 Risk Assessment **3.1**

3.1 Hazard Identification **3.2**
3.1.1 Disaster Declaration History 3.5
3.2 Hazard Profiles **3.7**
3.2.1 Avalanche 3.9
3.2.2 Dam Failure 3.13
3.2.3 Drought 3.17
3.2.4 Earthquake 3.26
3.2.5 Erosion/Deposition 3.33
3.2.6 Flood 3.35
3.2.7 Hazardous Materials Release 3.42
3.2.8 Landslide, Mudflow/Debris Flow, Rock Fall 3.47
3.2.9 Lightning 3.53
3.2.10 Mountain Pine Beetle Infestation 3.56
3.2.11 Severe Winter Weather 3.63
3.2.12 Wildfire 3.69
3.2.13 Windstorm 3.81
3.2.14 Hazard Profiles Summary 3.86
3.3 Vulnerability Assessment **3.89**
3.3.1 Methodology 3.89
3.3.2 Community Asset Inventory 3.90

3.3.3 Vulnerability by Hazard 3.98
3.3.4 Development and Land Use Trends 3.123
3.4 Risk Assessment Summary 3.129

4 Mitigation Strategy 4.1

4.1 Mitigation Strategy Overview 4.1
4.2 Goals and Objectives 4.2
4.3 Identification and Analysis of Mitigation Actions 4.3
4.3.1 Prioritization Process 4.4
4.4 Mitigation Action Plan 4.6
4.4.1 Progress on Previous Mitigation Actions 4.6
4.4.2 Continued Compliance with NFIP 4.8
4.4.3 Updated Mitigation Action Plan 4.8

5 Plan Implementation and Maintenance 5.1

5.1 Implementation 5.1
5.2 Monitoring, Evaluating, and Updating the Plan 5.2
5.2.1 Hazard Mitigation Planning Committee 5.2
5.2.2 Plan Maintenance Schedule 5.3
5.2.3 Plan Maintenance Process 5.3
5.3 Incorporation into Existing Planning Mechanisms 5.4
5.4 Continued Public Involvement 5.5

Annexes

Annex A: Unincorporated Summit County

Annex B: Town of Blue River

Annex C: Town of Breckenridge

Annex D: Town of Dillon

Annex E: Town of Frisco

Annex F: Town of Silverthorne

Annex G: Town of Montezuma

Annex H: Buffalo Mountain Metropolitan District

Annex I: Fire Protection Districts

Annex J: Copper Mountain Consolidated Metropolitan District

Annex K: Denver Water

Annex L: Water and Water and Sanitation Districts

Annex M: Hamilton Creek Metropolitan District

Appendices

Appendix A: References

Appendix B: Planning Process Documentation

Appendix C: Mitigation Alternatives and Prioritization

Appendix D: Hazard Mitigation Planning Committee

Appendix E: Plan Adoption

EXECUTIVE SUMMARY

The purpose of natural hazards mitigation is to reduce or eliminate long-term risk to people and property from natural hazards. 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 to be consistent with the new 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:

- Summit County
- Town of Blue River
- Town of Breckenridge
- Town of Dillon
- Town of Frisco
- Town of Silverthorne
- Town of Montezuma*
- Buffalo Mountain Metropolitan District
- Lake Dillon Fire Protection District
- 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*
- Snake River Water District*

*New participant in 2013

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 possible 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 identified in 2008 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 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

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 2008 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 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.

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 natural 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 make Summit County and participating jurisdictions eligible for certain federal disaster assistance, specifically the Federal Emergency Management Agency's pre and post disaster mitigation grants, 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).

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.

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 planning process:

- Summit County
- Town of Blue River
- Town of Breckenridge
- Town of Dillon
- Town of Frisco
- Town of Silverthorne
- Town of Montezuma*
- 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*
- Snake River Water District*
- Denver Water*
- Lake Dillon Fire Protection District
- Red, White, and Blue Fire Protection District

* New participating jurisdiction in 2013

This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the *Federal Register* on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. 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).

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 release. 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 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, and population
- Hazard information on location, previous occurrences, probability of future occurrences, and magnitude/severity for geographically specific hazards
- 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
- Mitigation actions specific to the jurisdiction

1.4 Plan Organization

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

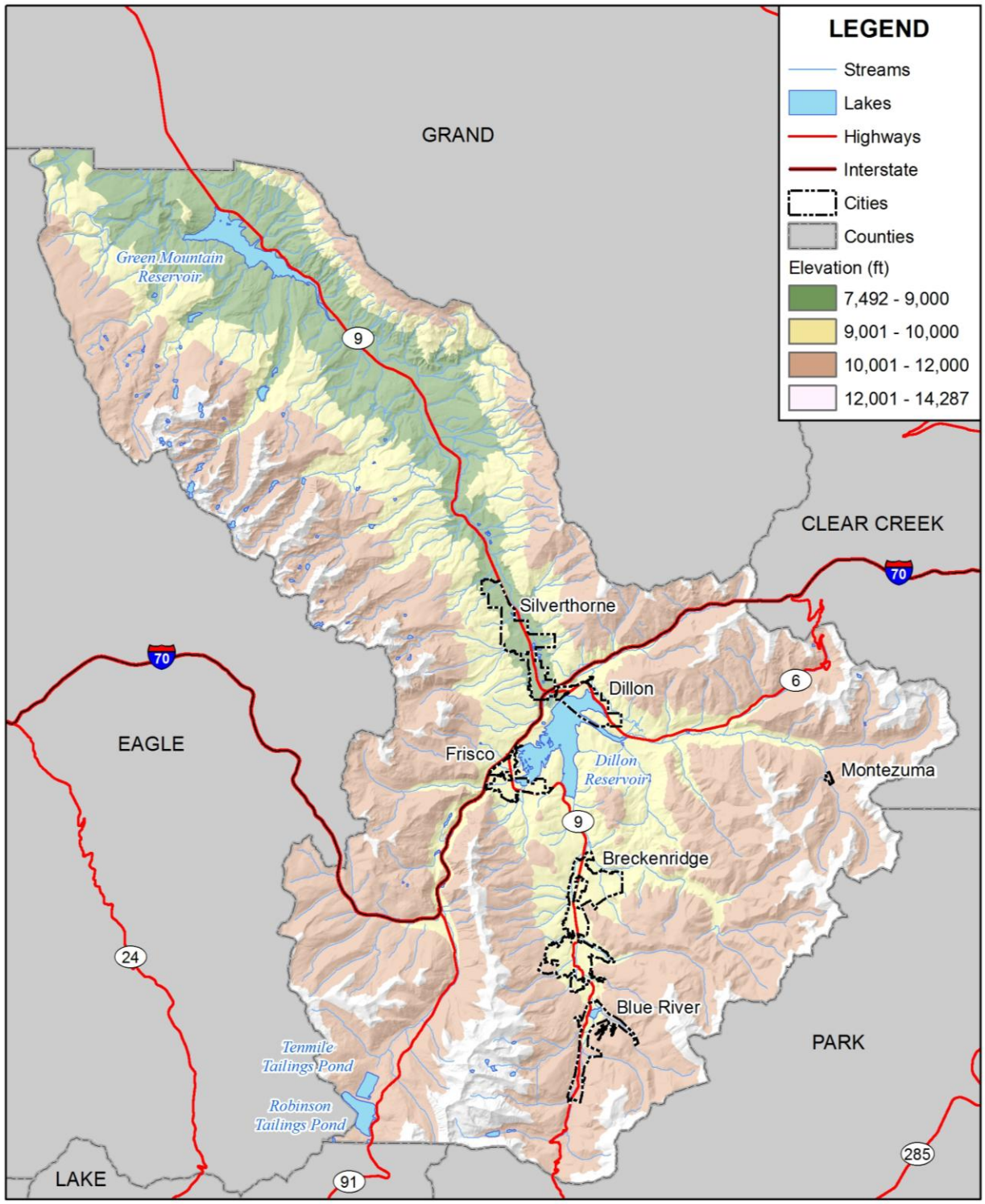
- Executive Summary

- 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

1.5 Planning Area Profile

Figure 1.1 shows a map of the Summit County planning area.

Figure 1.1. Summit County



Map compiled 3/2013; intended for planning purposes only.
Data Source: 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 (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 14,270 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 20th largest population of the 64 counties in Colorado as of 2012. Summit County grew by 19.1 percent between 2000 and 2012. The estimated County population in 2012 was 28,044. The 2010 U.S. Census recorded the population at 27,994, up from 23,548 as of the 2000 U.S. Census. The majority of the County's population is in unincorporated areas. Population estimates for the years 2010 and 2011 for each of the incorporated towns and the unincorporated County are provided in Table 1.1. Estimates for 2012 were not yet available for the towns as of the writing of this plan update.

Table 1.1. Summit County Population

Jurisdiction	April 2000	April 2010	July 2011*
Town of Blue River	685	849	733
Town of Breckenridge	2,408	4,540	4,351
Town of Dillon	802	904	626
Town of Frisco	2,443	2,683	2,661
Town of Montezuma	42	65	77
Town of Silverthorne	3,196	3,887	3,815
Unincorporated Summit County	13,972	15,066	16,208
Total Summit County	**23,548**	**27,994**	**27,496**

Source: 2010 US Census, 2011 American Community Survey, factfinder2.census.gov
*Estimate

Select 2010 U.S. Census demographic and social characteristics 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 (%)	54.9	57.4	55.7	51.9	55.9	63.1	54.0
Female (%)	45.1	42.6	44.3	48.1	44.1	36.9	46.0
Under 5 Years (%)	5.5	6.5	4.3	5.3	3.8	4.6	7.4
65 Years and Over (%)	7.8	5.4	5.8	15.3	11.7	3.1	7.5
Race/Ethnicity (one race)							
White (%)	89.7	98.6	93.1	89.2	94.2	86.2	80.6
Black (%)	0.8	0.5	0.7	0.3	0.4	3.1	2.4
American Indian and Alaska Native (%)	0.3	0.2	0.1	0.8	0.3	0.0	0.3
Asian (%)	1.0	0.5	1.2	2.2	1.3	0.0	1.3
Native Hawaiian and Other Pacific Islander (%)	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Other (%)	6.6	0.0	3.4	6.1	2.2	9.2	12.9
Hispanic/Latino (Any Race) (%)	14.2	2.8	9.0	10.8	5.2	10.8	27.6
Other							
Average Household Size	2.36	2.53	2.09	1.99	2.07	2.60	2.68
High School Grad or Higher (%)	94.5	98.7	99.1	95.4	93.9	100	91

Source: U.S. Census Bureau, 2010, factfinder2.census.gov/

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 general 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.

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. Today's 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 is developing 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 2010 U.S. Census, the industries that employed the highest percentages of Summit County's labor force were arts, entertainment, recreation, accommodation, and food services (28.6%); construction (16.0%); educational services, and health care and social assistance (11.3%); professional, scientific, and management, and administrative and waste management services (10.2%); finance, insurance, real estate, and rental and leasing (9.9%); and retail trade (9.4%). Select economic characteristics for Summit County from the 2010 Census are shown in Table 1.3. Characteristics for Summit County are for the entire County.

Table 1.3. 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 (%)	3.1	11.9	3.2	3.8	7.6	0.0	6.6
Individuals below Poverty Level (%)	7.3	11.0	7.6	6.8	3.9	11.5	6.9
Median Home Value ($)	465,700	544,400	682,100	435,400	495,700	625,000	441,600
Median Household Income ($)	68,750	78,750	54,000	76,042	80,102	68,333	71,691
Per Capita Income ($)	35,770	37,876	31,087	51,216	38,822	29,142	31,839
Population in Labor Force*	18,986	503	3,337	378	1,895	71	2,427
Unemployment (%)	4.7	8.5	3.2	1.1	5.2	16.9	1.6

Source: U.S. Census Bureau (2010), factfinder2.census.gov/
*Population 16 years and over

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 2013 update process, which included securing funding. The first version of this plan was approved by FEMA in 2008. Since the original development of the plan, FEMA guidance for local hazard mitigation plans has been refined and updated. The County contracted with AMEC Environment and Infrastructure (AMEC) in 2008 and 2013 to facilitate and develop a multi-jurisdictional, multi-hazard mitigation plan as well as its update. AMEC'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 Office of Emergency Management, Colorado Water Conservation Board, 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 Plan Section Review and Analysis – 2013 Update

This multi-jurisdictional, multi-hazard mitigation plan update involved a comprehensive review and update of each section of the 2008 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 2013 update is detailed in Table 2.1. As part of this plan update,

all sections of the plan were reviewed and updating to reflect new data and methodologies on hazards and risk, risk analysis process, capabilities, participating jurisdictions and stakeholders, 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. Only the information and data still valid from the 2008 plan was carried forward as applicable to this plan update.

The County received grant funding from the State including Emergency Management Performance Grant (EMPG) and the Colorado Water Conservation Board (CWCB). CWCB funding was used to update and enhance the flood hazard aspects of the plan. A portion of the update was funded with National Earthquake Hazard Reduction Program (NEHRP) funds to further analyze the earthquake risk and consider mitigation actions related to earthquakes.

Table 2.1. 2013 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 2010 census data and current economy description.
2.0 Planning Process	Described and documented the planning process for 2008 and 2013 update, including coordination among agencies and integration with other planning efforts. Described any changes in participation in detail. Described 2013 public participation process.

Plan Section	Update Review and Analysis
3.0 Risk Assessment	Revisited former hazards list for possible modifications. Reviewed hazards from the 2010 Colorado State Hazard Mitigation Plan (CSHMP) for consistency. Updated list of disaster declarations to include 2008-2013 data. Updated NCDC and SHELDUS tables to include 2008-2013 data. Updated past occurrences for each hazard to include 2008-2013 data. Updated critical facilities identification from the 2008 plan. Updated growth and development trends to include Census 2010 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. Estimated flood losses using the preliminary Summit County DFIRM. Updated NFIP data and Repetitive Loss structure data from the previous plan. Incorporated new hazard loss estimates since 2008, as applicable. Used new 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 developed 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. Updated maps in plan where appropriate.
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 CSHMP 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 2008 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 2008 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.

Plan Section	Update Review and Analysis
Jurisdictional Annexes	Developed annexes for new participating jurisdictions in 2013. Updated previous participants' annexes with 2010 census data. Updated past event history and hazard loss estimates. Added new maps or updated old maps as needed. Updated mitigation actions from 2008 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 – Plan Adoption (new in 2013).

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 city and special district in the County to participate in the multi-jurisdictional Summit County Multi-Hazard Mitigation Plan. Outreach to expand the participating jurisdictions occurred during the 2013 update. 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 or its 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 the AMEC Data Collection Guide
- Identify 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 the 2013 update to increase the multi-jurisdictional participation. Seven special districts and one small town (Montezuma) were added to the plan in 2013 and are indicated in the table below. 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. Table 2.2 shows the attendance of representatives at each HMPC meeting; sign-in sheets are included in Appendix B: Planning Process Documentation. Montezuma missed the initial planning meetings but discussed joining the planning process in a town council meeting with Summit County Emergency Management in June 2013. The Town

prepared a data collection guide and mitigation projects which are captured in their jurisdictional annex. Emails detailing meetings between the County and the Town of Montezuma are included in Appendix B Planning Process Documentation.

Table 2.2. Jurisdictional Participation in 2013 HMPC Meetings

Jurisdiction	Kickoff Meeting	Meeting #2	Meeting #3	Open House
Summit County	✓	✓	✓	✓
Town of Blue River	✓			
Town of Breckenridge	✓	✓		
Town of Dillon	✓	✓	✓	
Town of Frisco	✓	✓		
Town of Silverthorne	✓			
Town of Montezuma*+				
Buffalo Mountain Metropolitan District	✓	✓	✓	✓
Lake Dillon Fire Protection District	✓	✓	✓	
Red, White, and Blue Fire Protection District	✓	✓	✓	✓
Copper Mountain Consolidated Metropolitan District*	✓			✓
East Dillon Water District*	✓	✓	✓	
Hamilton Creek Metropolitan District*	✓			
Dillon Valley District*	✓			
Mesa Cortina Water and Sanitation District*	✓			
Snake River Water District*	✓	✓		
Denver Water*	✓		✓	

*New participating jurisdiction in 2013

+ Participated through individual meetings & coordination with County and AMEC

2.4 The 10-Step Planning Process

AMEC 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* (2008) and the State and Local Mitigation Planning How-To Guides (2001), which include *Multi-Jurisdictional Mitigation Planning* (2006). 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, AMEC 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 Loss and Severe Repetitive Loss grants), Community Rating System, and the flood control projects authorized by the U.S. Army Corps of Engineers (USACE). Table 2.3 shows how the modified 10-step process fits into FEMA's four-phase process.

Table 2.3. Mitigation Planning Process Used to Develop the Plan

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

Summit County Multi-Hazard Mitigation Plan Kickoff Meeting

Phase I Organize Resources

Step 1: Organize the Planning Effort

AMEC 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 2013 update. The original planning process effort is well documented and can be referenced in the 2008 version 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 AMEC during 2008 and again during the plan update in 2013. AMEC and the Emergency Manager identified the key county, municipal, and other local government and initial stakeholder representatives. Letters of invitation were mailed to invite them 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 development of the plan:

Summit County

- Summit County Office of Emergency Management
- Summit County Engineering
- Summit County Environmental Health
- Summit County Information Systems (GIS)
- Summit County Planning
- Summit County Building Department
- Summit County Sheriff's Office

Participating Jurisdictions

- Town of Blue River Mayor'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 Montezuma
- 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
- Snake River Water District
- Lake Dillon Fire Protection District
- Red, White, and Blue Fire Protection District
- Summit County School District

Other Government and Stakeholder Representatives

- St. Anthony's Summit Medical Center
- Upper Blue Sanitation District
- Town of Montezuma
- Lower Blue Fire Protection District
- Willow Brook Metropolitan District
- Colorado Office of Emergency Management
- Colorado Division of Water Resources
- Colorado Water Conservation Board
- Colorado Geological Survey
- Colorado Department of Transportation
- Colorado State University Extension
- Colorado River District
- 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
- American Red Cross
- Colorado Mountain College
- Denver/Boulder Colorado Weather Forecast Office
- Xcel Energy
- Water Solutions, Inc.

The plan update process officially began with a kickoff meeting in Frisco, Colorado, on January 30, 2013. The Summit County Office of Emergency Management mailed letters of invitation to the kickoff meeting to county, municipal, district, state, and other stakeholder representatives. This list is included in Appendix B.

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, an FTP (file transfer protocol) site, and a Microsoft SharePoint site hosted by AMEC. SharePoint was utilized to host documents related to the planning process, post information and meeting materials, and share drafts of the plan and its annexes for jurisdictional review and input. Draft documents were typically posted on the SharePoint site so that HMPC members could access and review them. The HMPC met three times during the planning period (January 20, 2013 to May 9, 2013). The meeting schedule and topics are listed in Table 2.4. The sign-in sheets and agendas for each of the meetings are included in Appendix B.

Table 2.4. Schedule of HMPC Meetings

Meeting	Topic	Date
Kickoff Meeting	Introduction to DMA and the planning process; Identification of hazards impacting Summit County	January 30, 2013
HMPC #2	Review of updated risk assessment; Review of goals and objectives	April 11, 2013
HMPC #3	Identification, prioritization, and status update of mitigation actions; Discussion of process to monitor, evaluate, and update plan	May 9, 2013

During the kickoff meeting, AMEC 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. AMEC also introduced 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 did not make any revisions to the hazards list from the 2008 plan. Participants were given the AMEC Data Collection Guide to facilitate the collection of information needed to support the plan update, such as data on historic hazard events, values at risk, and current capabilities. New participating jurisdictions completed and returned the worksheets in the data collection guide to AMEC. Existing jurisdictions from the 2008 planning effort provided updates directly to their respective annex, or provided information for AMEC to incorporate.

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.

During the plan update's drafting stage, the HMPC held a Multi-Hazards Planning Open House at the County Commons Building in Frisco on July 9, 2013. The public was informed of the meeting through notices on the Summit County website and articles in the *Summit Daily* on July 4th and 6th, 2013. HMPC members were sent an electronic copy of the press release to distribute as they saw fit. A copy of the sign-in sheet is provided in Appendix B.

There were no formal presentations during the open house, but rather a number of presentation stations. The presentation stations included information around the high hazards (avalanche, flood/water, and wildfire), a station for all other hazards including earthquake, and a station showcasing plan goals and actions. There was also a station on personal preparedness. The presentation stations were staffed by representatives from County Engineering and Emergency Management, AMEC, Red Cross, Denver Water, the Colorado Avalanche Information Center, Copper Mountain Consolidated Metro District, and Red White and Blue Fire Protection District. The purpose of the open house was to invite the public and stakeholders in the mitigation plan to 1) learn about the plan's purpose and benefits, 2) present the results of the countywide risk assessment, and 3) discuss community concerns and priorities for reducing risk to natural disasters. A public survey was provided to gather feedback on the plan update initiative. Four surveys were returned, all of which identified the same primary concerns including ingress/egress issues (particularly for Summit Cove), evacuation route development, and issues with notifying the public (including full-time residents and the seasonal population). One

member of the public from the Lower Blue Valley also submitted comments directly to Summit County OEM. This citizen also identified emergency communication with the public as a major concern. Cell phone reception is somewhat poor in the County, and people may not always have access to landlines during an emergency event. Two new mitigation actions were developed as a result of the public involvement process, including an action related to cell phone service/warning improvement in the Lower Blue Valley and another regarding a combustible roof replacement program.

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 Office of Emergency Management website at http://www.co.summit.co.us/emergencymanagement/ and in hard copy at the Summit County Sheriff's Office in Breckenridge.

The plan was available at these locations from July 5 to 19, 2013. The jurisdictions announced the availability of the draft plan and the public comment period in the *Summit Daily News* on July 4th and 6th, 2013. A copy of this notice is provided in Appendix B.

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 on the HMPC and were listed previously 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 invite by letter to the open house on July 9, 2013. The list of stakeholders invited and the invitation letter are included in Appendix B. The invitation letter

HMPC Members Discuss Risk Assessment Findings

was also distributed through The Greenlands Reserve Forest Health Task Force.

As part of the coordination with other agencies, the HMPC collected and reviewed existing technical data, reports, and plans. State and federal agency data sources, including National Weather Service web pages and FEMA Flood Insurance Studies, were used to collect information. Summit County and its communities use a variety of comprehensive planning mechanisms, such as land use and general plans, emergency operations plans, and municipal ordinances and building codes, to manage community growth and development. This information was used in the development and update of the hazard identification, vulnerability assessment, and capability assessment and in the formation of goals, objectives, and mitigation actions. These sources are documented throughout the plan and specifically in the capability assessment sections of each jurisdictional annex.

Phase 2 Assess Risk

Step 4: Identify the Hazards

AMEC assisted the HMPC in a process to identify the natural hazards that have impacted or could impact communities in Summit County. At the kickoff meeting in 2008, 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 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 2013 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. The Summit County Data Collection Guide distributed at the kickoff meeting helped identify hazards and vulnerabilities specific to the participating jurisdictions. 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 estimate flood losses during the update.

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, personnel, fiscal, and technical capabilities, as well as ongoing initiatives related to interagency coordination and public outreach. This information is included in the jurisdictional annexes.

AMEC provided the draft risk assessment to the HMPC in May 2013 for review and comment. Results of the risk assessment were presented and comments discussed at the second meeting of the HMPC.

Phase 3 Develop the Mitigation Plan

Step 6: Set Goals

AMEC 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 2008 plan were still relevant; they remained unchanged except for a minor edit of an objective. 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 2008 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 June 2013. 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 July 5-19, 2013. 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 Office of Emergency Management, Colorado Water Conservation Board, and FEMA Region VIII.

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 the Appendix D – Plan Adoption.

Step 10: Implement, Evaluate, and Revise the Plan

The HMPC developed and agreed upon an overall strategy for plan implementation and for monitoring and maintaining the plan over time during Meeting #3. This strategy is described in Chapter 5 and was updated in 2013.

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.

The risk assessment for Summit County and its jurisdictions followed the methodology described in the FEMA publication 386-2, *Understanding Your Risks: Identifying Hazards and Estimating Losses* (2002), which includes a four-step process:

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.
- **Section 3.3 Vulnerability Assessment** assesses the County's total 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 2008 planning process, the Summit County Hazard Mitigation Planning Committee (HMPC) reviewed data and discussed the impacts of each of the hazards required by FEMA for consideration, which are listed alphabetically below, to determine the hazards that threaten the planning area:

Avalanche	Extreme Heat	Tornado
Coastal Erosion	Flood	Tsunami
Coastal Storm	Hailstorm	Volcano
Dam/Levee Failure	Hurricane	Wildfire
Drought	Land Subsidence	Windstorm
Earthquake	Landslide	
Expansive Soils	Severe Winter Storm	

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. There are no coal mines in Summit County. The HMPC are unaware of any areas of concern or past impacts.
Tornado	Past events have been rare and weak in strength (F0). 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.

Source: Summit County Hazard Mitigation Planning Committee, 2008

*Although Summit County has received USDA disaster declarations for these hazards, it was as a contiguous county, and no information has been found to suggest that the County was seriously impacted.

The HMPC identified 13 natural hazards that significantly affect the planning area and organized these hazards to be consistent with the State of Colorado Natural Hazards Mitigation Plan

(2011). The list of hazards did not change during the 2013 plan update process. These hazards are profiled in further detail in the next section and are listed in Table 3.2 along with a checkmark indicating the jurisdictions impacted by the hazard. Hazard tables for the special districts (apart from the fire protection districts) are included in their individual annexes.

Although not required by the Disaster Mitigation Act, the HMPC decided to address one human-caused hazard—hazardous materials release. The risk from this hazard is related primarily to the transportation of hazardous materials through the County, and the HMPC believed this was an important issue to incorporate into this hazard planning process.

The HMPC also decided to profile mountain pine beetle infestation. This hazard has had widespread affect on the lodgepole pine tree population in the County and relates to wildfire risk and has secondary risks associated with the potential for blowdown hazards.

Table 3.2. Hazards Identified for Each Participating Jurisdiction

Hazard	Summit County	Blue River	Breckenridge	Dillon	Frisco	Montezuma	Silverthorne	Lake Dillon FPD*	Red, White, and Blue FPD*
Avalanche	✓	✓	✓						
Dam Failure	✓		✓	✓	✓		✓		
Drought	✓	✓	✓	✓	✓	✓	✓	✓	✓
Earthquake	✓	✓	✓	✓	✓	✓	✓		
Erosion and Deposition	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flood	✓	✓	✓	✓	✓		✓	✓	✓
Hazmat Release	✓	✓	✓	✓	✓		✓	✓	✓
Landslide, Mudflow/Debris Flow, Rockfall	✓	✓	✓	✓	✓		✓	✓	✓
Lightning	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mountain Pine Beetle Infestation	✓	✓	✓	✓	✓	✓	✓	✓	✓
Severe Winter Weather	✓	✓	✓	✓	✓	✓			
Wildfire	✓	✓	✓	✓	✓	✓	✓	✓	✓
Windstorm	✓	✓	✓	✓	✓	✓	✓	✓	✓

Source: Summit County Hazard Mitigation Planning Committee, 2013
*FPD=Fire Protection District

Data on the past impacts and future probability of these hazards was collected from the following sources:

- Summit County HMPC
- FEMA Region VIII
- Colorado Geological Survey
- State of Colorado Natural Hazards Mitigation Plan (2011)
- Information on past hazard events from the Spatial Hazard Event and Loss Database (SHELDUS), a component of the University of South Carolina Hazards Research Lab, that compiles county-level hazard data for 18 different natural hazard event types
- Information on past extreme weather and climate events from the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center
- Disaster declaration history from FEMA, the Public Entity Risk Institute, 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, and/or the Small Business Administration (SBA). FEMA also issues emergency declarations, which are more limited in scope and without the long-term federal recovery programs of major disaster declarations. The quantity and types of damage are the determining factors.

A USDA disaster declaration certifies that the affected county has suffered at least a 30% loss in one or more crop or livestock areas and provides affected producers with access to low-interest loans and other programs to help mitigate the impact of the disaster. In accordance with the Consolidated Farm and Rural Development Act, all counties neighboring those receiving disaster declarations are named as contiguous disaster counties and, as such, are eligible for the same assistance.

Table 3.3 lists state and federal disaster declarations received by Summit County. Many of the disaster events were regional or statewide; therefore, reported costs are not accurate reflections of losses to Summit County.

Table 3.3. Disaster Declaration History in Summit County, 1953-Present

Date Declared	Disaster Name	Declaration Type	Disaster Number	Cost ($)
1/9/2013	Drought, high winds, wildfire, excessive heat, insects	USDA (contiguous)	S3456	
7/3/2012	Drought, excessive heat, high winds	USDA (primary)	S3260	
2009	Severe Blizzard	Governor's Declaration		
2009	Severe Spring Snowstorm	Governor's Declaration		
8/8/2006	Heat, high winds, and ongoing drought	USDA (contiguous)	S2351	
7/11/2006	Heat, high winds, insect pests, late freeze, and ongoing drought	USDA (contiguous)	S2329	
7/10/2006	Drought, fire, high winds, and heat	USDA (contiguous)	S2327	
1/4/2006	Drought	USDA (contiguous)	S2188a	
1/4/2006	Wind, heavy rain, and hail	USDA (contiguous)	S2188b	
9/5/2005	Hurricane Katrina Evacuation	Presidential Emergency Declaration	3224	15,279,405*
4/9/2003	Snow	Presidential Emergency Declaration	3185	9,786,362*
6/19/2002	Wildfires	Presidential Major Disaster Declaration	1421	7,131,538[1]
2002	Drought	USDA		
1995	Flooding	State		
1/29/1977	Drought	Presidential Emergency Declaration	3025	4,873,838*

Source: State of Colorado Natural Hazards Mitigation Plan 2011; Public Entity Risk Institute Presidential Disaster Declaration Site, www.peripresdecusa.org/mainframe.htm; USDA Farm Service Agency, http://www.fsa.usda.gov/FSA/webapp?area=home&subject=diap&topic=landing

[1]Costs are in 2006 dollars and are statewide

*The Public Entity Risk Institute's extent of record is 2009, which is why the damage estimate is in 2009 dollars.

More than half of the declarations were for, or included, drought (eight out of fifteen declarations). These declarations, which were USDA declarations with the exception of one, were in 1977, 2002, 2006 (four declarations in that year alone), 2012, and 2013. 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.

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 in Section 3.1 Hazard Identification are profiled individually in this section. The 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.

The sources used to collect information for these profiles include the following:

- Disaster declaration history from FEMA, the Public Entity Risk Institute, and the USDA Farm Service Agency
- State of Colorado Natural Hazards Mitigation Plan (2011)
- Summit County Community Wildfire Protection Plan (2013)
- Summit County Countywide Comprehensive Plan (2009)
- Internet resources on past hazard events, such as the SHELDUS database created by the University of South Carolina Hazards Research Lab and the National Climatic Data Center Storm Events Database
- Geographic information systems (GIS) data from the Summit County GIS Department
- Statewide GIS datasets compiled by state and federal agencies
- Other existing plans and reports
- Personal interviews with HMPC members and other stakeholders
- Summit County OEM incident logs
- Summit County Data Collection Guide completed by each participating jurisdiction

Detailed profiles for each of the identified hazards include information on the following characteristics of the hazard:

Hazard Description

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

Geographic Location

This section describes the geographic extent 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 section includes information on historic incidents, including impacts and costs, if known. A historic incident worksheet was used to capture information from participating jurisdictions on past occurrences. Information from the HMPC was combined with other data sources, including those previously mentioned.

Probability of Future Occurrence

The frequency of past events 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

The probability, or chance of occurrence, was calculated where possible based on existing data. Probability was determined by dividing the number of events observed by the number of years and multiplying by 100. This gives the percent chance of the event happening in any given year. An example would be three droughts occurring over a 30-year period, which suggests a 10% chance of a drought occurring in any given year.

Magnitude/Severity

This section summarizes the magnitude/severity or extent of a hazard event in terms of deaths, injuries, property damage, and interruption of essential facilities and services. Magnitude and 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

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 create an avalanching episode. According to the Colorado Avalanche Information Center (CAIC), about 90% of all avalanches start on slopes of 30-45 degrees; about 98% of all avalanches occur on slopes of 25–50 degrees. Avalanches 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; 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. 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.

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 federally owned lands. Unincorporated Summit County is the jurisdiction with the most avalanche risk. However, highway closures due to an event can affect all participating jurisdictions.

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 Climatic Data Center Storm Events Database and the CAIC have information on 23 notable avalanches (e.g., avalanches that involved people) that occurred in Summit County between 1987 and 2013, details of these and others are summarized below.

- **April 20, 2013**—Five people were killed in the deadliest avalanche in Colorado in 50 years. It occurred in adjacent Clear Creek County but involved Summit County first responders. The avalanche occurred on Sheep Creek near Loveland Pass on Mount Sniktau. 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. (See Figure 3.1.)
- **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.
- **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 3.1. Arapahoe Basin Avalanche, May 20, 2005

Source: Colorado Avalanche Information Center, http://avalanche.state.co.us/ (© Dan Moroz, 2005)

There were several other notable events discussed by 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 2013, there were 22 notable avalanches in Summit County (e.g., avalanches that involved people). This suggests that at least one notable avalanche occurs nearly every year in Summit County.

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

Avalanches in Summit County can injure and kill multiple people, damage property and infrastructure, and cause road closures.

3.2.2 Dam Failure

Hazard Description

Dams are constructed for a variety of uses, including flood protection, power, agriculture, 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
- Inadequate spillway capacity resulting in excess overtopping flows
- Internal erosion caused by embankment or foundation leakage or piping or rodent activity
- Improper design
- Improper maintenance
- Negligent operation
- Failure of upstream dams on the same waterway

Geographic Location

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

HAZUS-MH contains a database of dams based on the National Inventory of Dams. This database lists nine dams in the County and classifies dams based on the potential hazard to the downstream area resulting from failure or misoperation of the dam or facilities:

- **High Hazard Potential**—Probable loss of life (one or more)

- **Significant Hazard Potential**—No probable loss of human life but can cause economic loss, environment damage, disruption of lifeline facilities, or impact other concerns; 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 five high hazard dams, three significant hazard dams, and one low hazard dam in Summit County. These dams are listed in Table 3.4 and illustrated in Figure 3.2. The high and significant hazard dams all have emergency action plans in place, with the exception of Reynolds.

Table 3.4. Summit County Dams

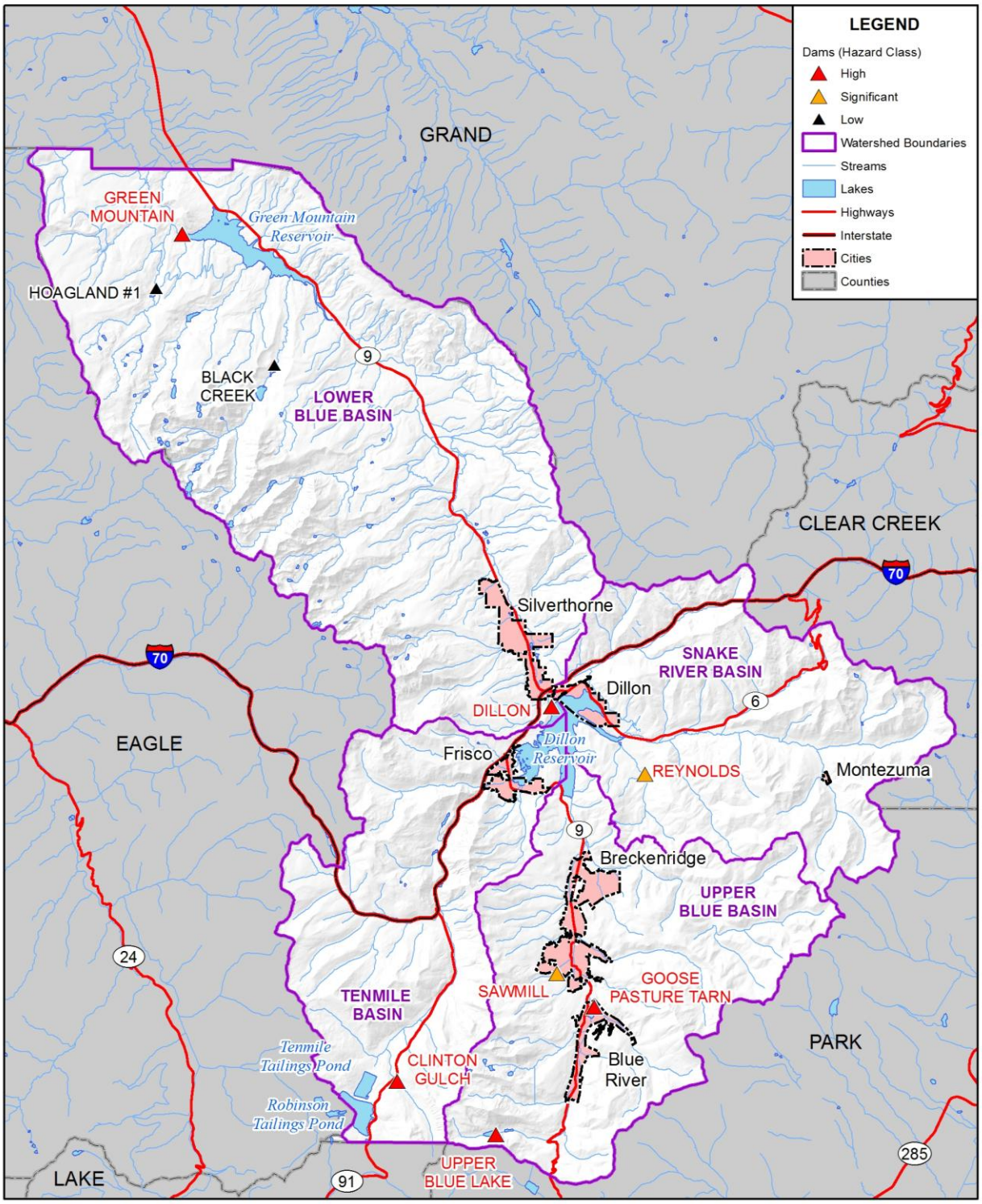
Name	River	Near City	Maximum Storage (acre feet)	Hazard Class
Black Creek	Black Creek	Kremmling	428	Significant
Clinton Gulch	Ten Mile Creek	Frisco	4,500	High
Dillon	Blue River	Frisco	257,304	High
Goose Pasture Tarn	Blue River	Breckenridge	812	High
Green Mountain	Blue River	Kremmling	153,639	High
Hoagland #1	Elliott Creek	Kremmling	476	Low
Reynolds	Soda Creek	Dillon	157	Significant
Sawmill	Sawmill Gulch	Breckenridge	37	Significant
Upper Blue Lake	Monte Cristo Creek	Blue River, Breckenridge	2,140	High

Source: HAZUS-MH National Inventory of Dams

Risk to dam failure is greatest to the Town of Silverthorne immediately downstream of the Dillon Dam. Breckenridge could be impacted by a failure of the Goose Pasture Tarn Dam, which is located just within the Town of Blue River. Breckenridge and Blue River could also be impacted by the failure of Upper Blue Lake Dam. Frisco and Copper Mountain Metro could be impacted by the failure of Clinton Gulch Dam. Unincorporated areas downstream of all high hazard dams are at risk if a failure occurred. There is little risk to Montezuma, or the Town of Dillon.

There are also tailings ponds in the southwestern corner of Summit County associated with molybdenum processing at the Climax mine. These structures are not ranked as high or significant hazard due to the fact that they hold little water. However, failure of these dams would release a devastating toxic sludge debris flow towards the Copper Mountain Metro District area. The Old Dillon Reservoir was in the process of being rebuilt and expanded for additional firefighting water storage and water rights enhancement. The reservoir is located near Dillon and Silverthorne; its hazard class as of 2013 was undetermined.

Figure 3.2. Summit County Dams



amec

0 5 10 Miles

N

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

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 (aka 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 or has a recurrence interval of greater than every 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 this risk is unknown.

Magnitude/Severity

Catastrophic—Multiple deaths; property destroyed and severely damaged; and/or interruption of essential facilities and service 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. The Bureau of Reclamation regularly monitors and maintains Green Mountain Dam. The dam continues to perform well. Failure of this dam would have greater impacts in Grand County and Kremmling.

A failure of the Dillon Dam would be catastrophic to the Town of Silverthorne and unincorporated areas of the County from the dam downstream to the Grand County border.

Failure of the tailings dam in the southwestern corner of the County would release a devastating toxic sludge debris flow.

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

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. 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.

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,

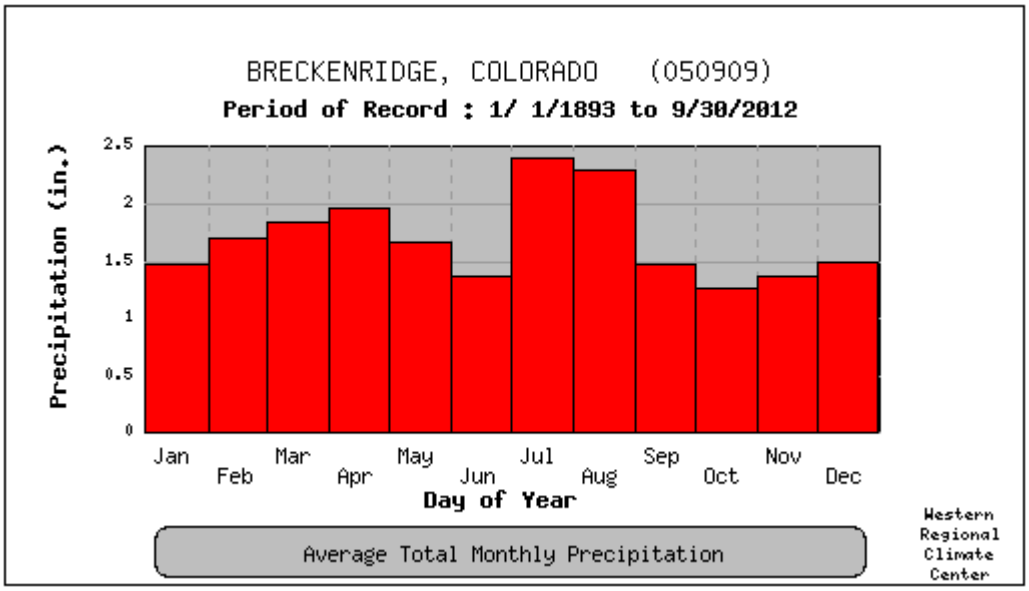
Dillon, and Green Mountain Dam. Precipitation is greatest in Breckenridge, where the month with the most average precipitation is July. Precipitation is least at the Green Mountain reservoir, where May is the month with the most average precipitation. Table 3.5 contains precipitation summaries for the three stations, and Figure 3.3 through Figure 3.5 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[3]	16.01	July/1.92	6.97/Feb. 1936	26.28/1936
Green Mountain Dam[4]	15.03	May/1.62	5.95/Sept. 1961	22.37/1945

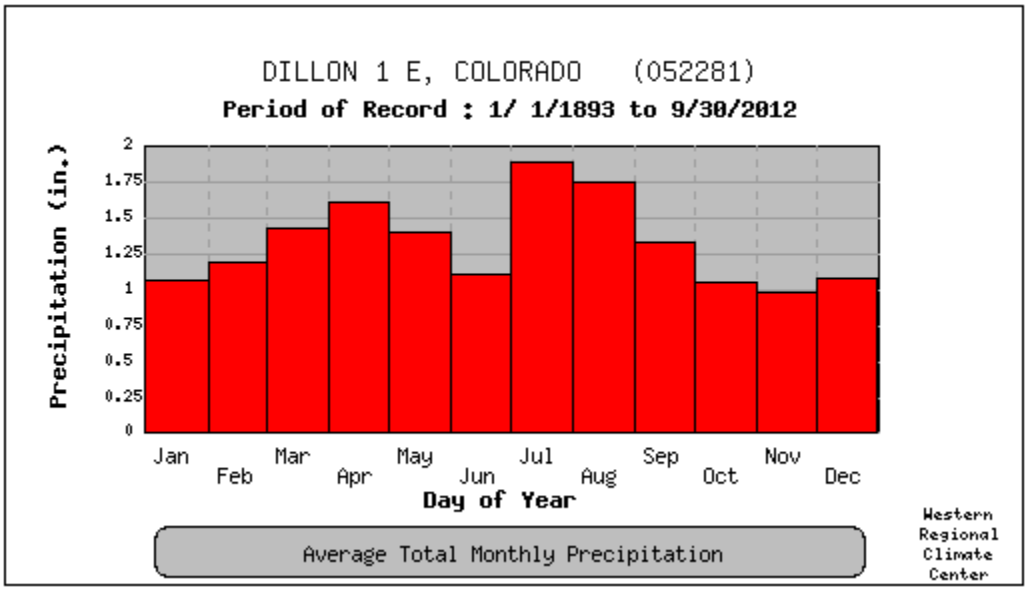
Source: Western Regional Climate Center, www.wrcc.dri.edu/.
[1]All totals are reported in inches;
[2]Period of Record: 1893-2012; [3]Period of Record: 1893-2012; [4]Period of Record: 1939-2012

Figure 3.3. Breckenridge Station Monthly Average Total Precipitation: 1893-2012



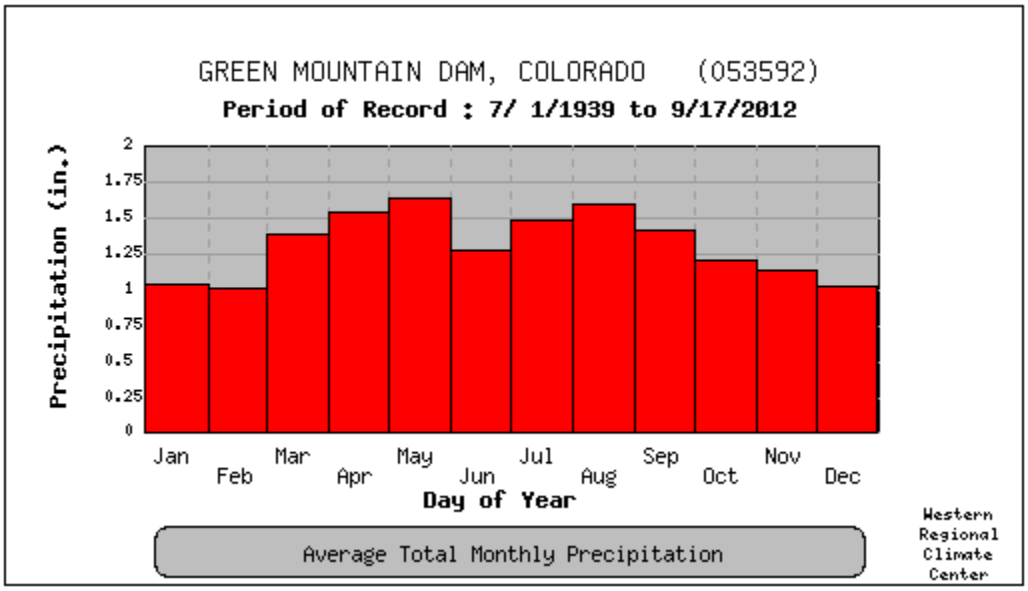
Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 3.4. Dillon Station Monthly Average Total Precipitation: 1893-2012



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

Figure 3.5. Green Mountain Dam Station Monthly Average Total Precipitation: 1939-2012



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

Previous Occurrences

Colorado has experienced multiple severe droughts. Colorado has experienced drought in 2013-2012, 2004-2000, 1996, 1994, 1990, 1989, 1979-1975, 1965-1963, 1957-1951, 1941-1931, and 1905-1893 (source: Colorado Drought Mitigation and Response Plan, 2010). 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
2012-2013	X		Ongoing

Source: McKee, et al.
*Modified for the Colorado State Drought Plan in 2010 and Summit County Mitigation Plan 2013 based on input from the Colorado Climate Center

The following droughts were significant to Summit County:

- **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).

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.

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 183 drought impacts from droughts that affected Summit County between 1990 and 2013. The list is not comprehensive. Most of the impacts, 85, were classified as "agricultural." Other impacts include "business and industry" (11), "energy" (1), "fire" (17), "plants and wildlife" (13), "relief, response, and restrictions" (57), "society and public health" (27), "tourism and recreation" (10), and "water supply and quality" (11). These categories are described as follows:

- **Agriculture**—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**—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.

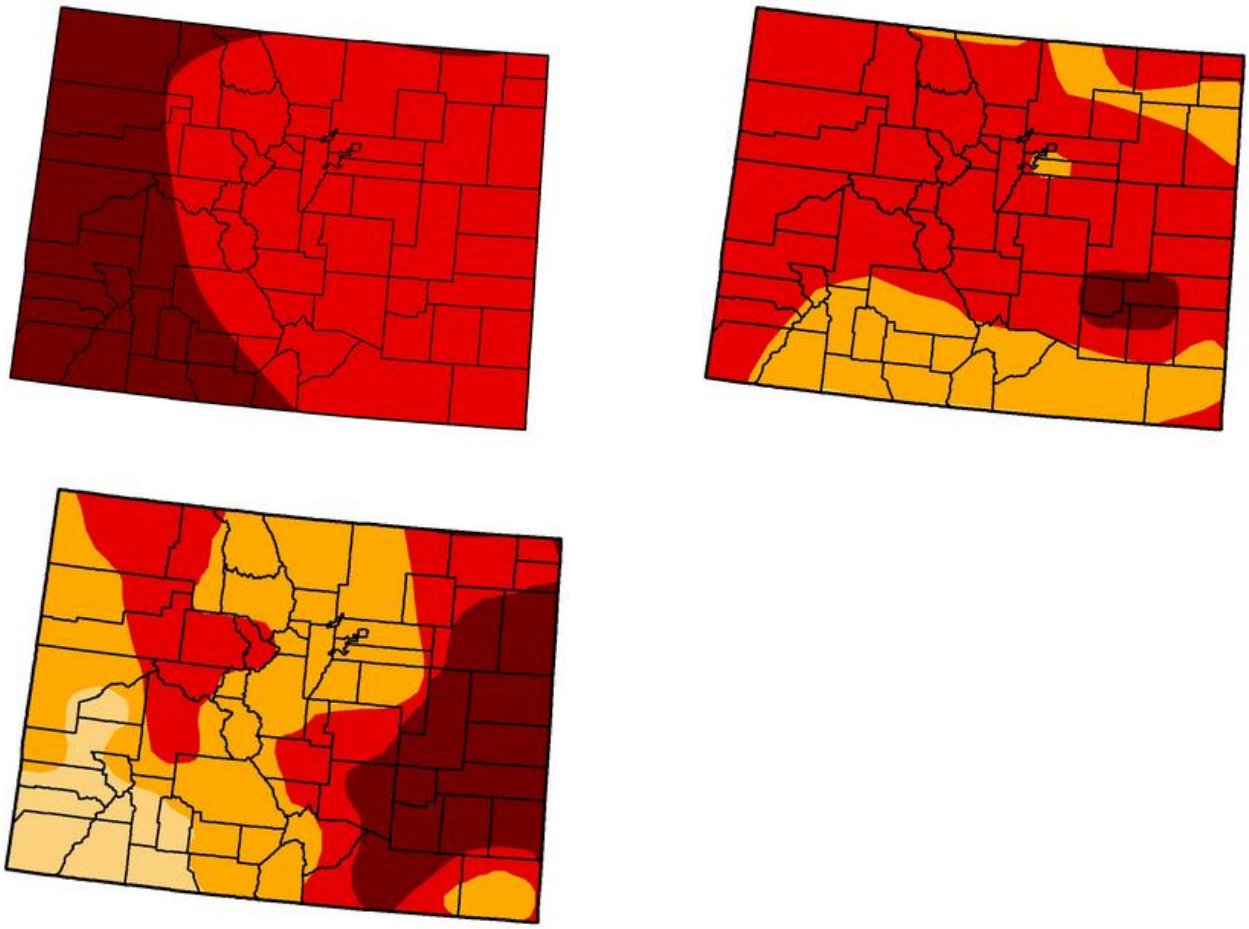
- **Energy**—This category concerns drought's effects on power production, rates, and revenue. Examples include production changes for both hydropower and non-hydropower providers, changes in electricity rates, revenue shortfalls and/or windfall profits, and purchase of electricity when hydropower generation is down.
- **Fire**—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**—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—**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—**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—**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**—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**—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**—Drought impacts that do not easily fit into any of the above categories.

Figure 3.6 compares the severity of the drought in Colorado in July of 2002 with the severity of the drought in late July 2012, as well as current conditions as of March 2013. 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. The U.S. Seasonal Drought Outlook (Figure 3.7) from the NWS Climate Prediction Center indicates that drought conditions in Summit County will persist or intensify through June 30, 2013.

Figure 3.6. U.S. Drought Monitor for Colorado, July 23, 2002 (top left) vs. July 24, 2012 (top right) and March 19, 2013 (bottom left)



State drought conditions (percent area)

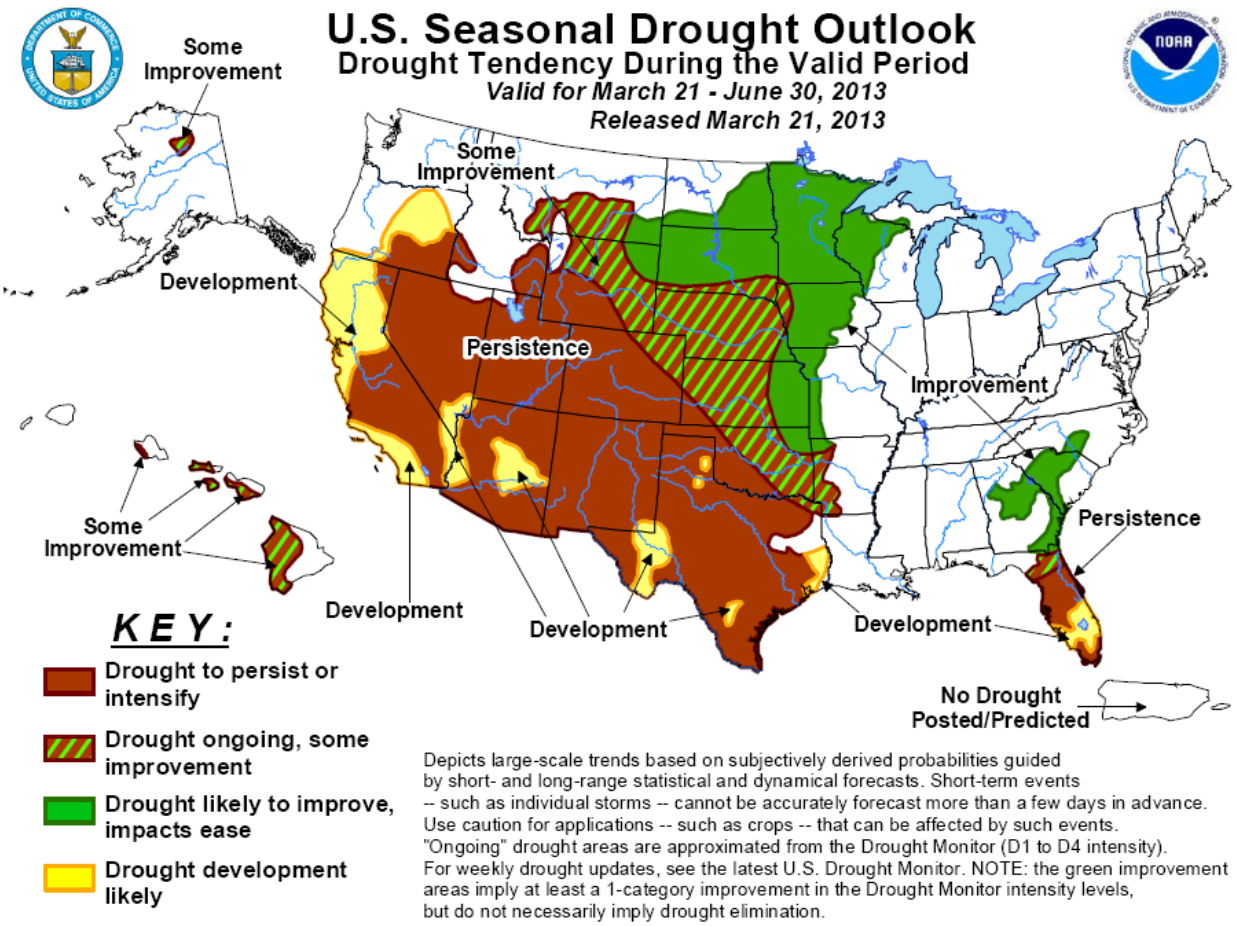
Week	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
07/23/2002	0.00	100.00	100.00	100.00	100.00	33.61
07/24/2012	0.00	100.00	100.00	99.70	73.67	2.82
03/19/13	0.00	100.00	100.00	88.97	48.06	21.22

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/

Figure 3.7. U.S. Seasonal Drought Outlook: March 21, 2013 – June 30, 2013



Source: National Weather Service Climate Prediction Center, http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html

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 120 years (1893-2013). Thus, there is a 41.7% chance that a drought will happen in Colorado in any given year, and a drought can be expected somewhere in the state every 2.4 years. Summit County has had significant impacts in six droughts in the last 35 years. It is unknown how long the current drought may persist.

A 2010 drought vulnerability study prepared by the CWCB 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.

3.2.4 Earthquake

Hazard Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause 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. Intensity is an expression of the amount of shaking, typically the greatest cause of losses to structures during earthquakes, at any given location on the surface as felt by humans and defined in the Modified Mercalli Intensity Scale. Table 3.7 features abbreviated descriptions of the 12 levels of intensity.

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), liquefaction, fires, and dam failure.

Table 3.7. Modified Mercalli Intensity (MMI) Scale

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

Source: Multi-Hazard Identification and Risk Assessment, FEMA 1997

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 Colorado 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, 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. Colorado's Earthquake and Fault Map developed by CGS in 2008 depicts the location of historic epicenters and potentially active faults. An excerpt of this map displaying Summit County and vicinity is shown in Figure 3.8. Another map produced by the CGS shows these potentially active faults with maximum credible earthquake determinations, illustrated in Figure 3.9.

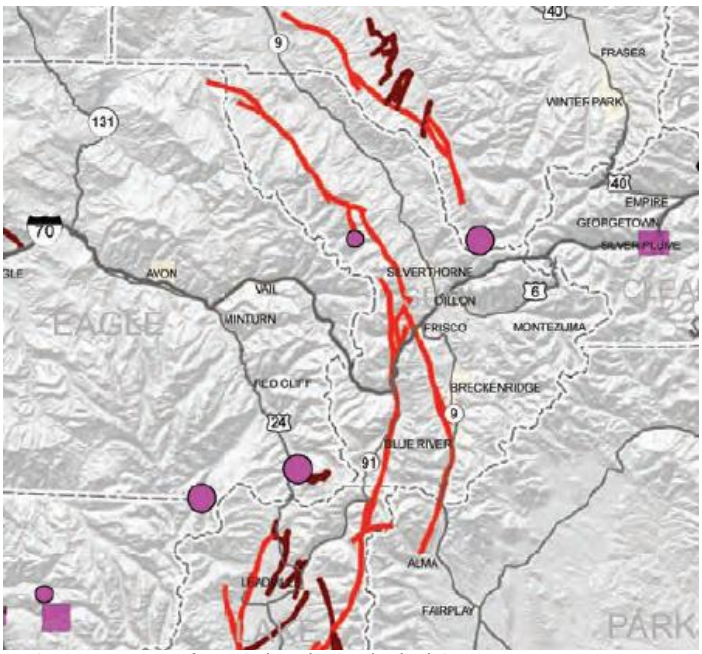
Faults are classified based on the geologic time frame of their latest suspected movement (in order of activity occurrence, the most recent is listed first):

- 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 depicted on Figure 3.9.

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 for the results of the state's analysis). Some of these faults are illustrated in Figure 3.9.

Figure 3.8. Statewide Earthquake Hazard Map Excerpt Showing Summit County



EARTHQUAKE EPICENTERS

Instrumentally located epicenters (~1962 to 2007)
Size of dot indicates magnitude.

- 5–5.5
- 4–4.9
- 3–3.9

Approximate location of pre-instrumental earthquake epicenters (~1867 to 1961). Square size indicates the maximum Modified Mercalli intensity for the earthquake (see back of map for intensity scale).

- VII
- VI
- V
- IV
- I-III

1882 Earthquake; magnitude estimated at 6.6 +/- 0.6 (Spence and others, 1996)

QUATERNARY FAULTS

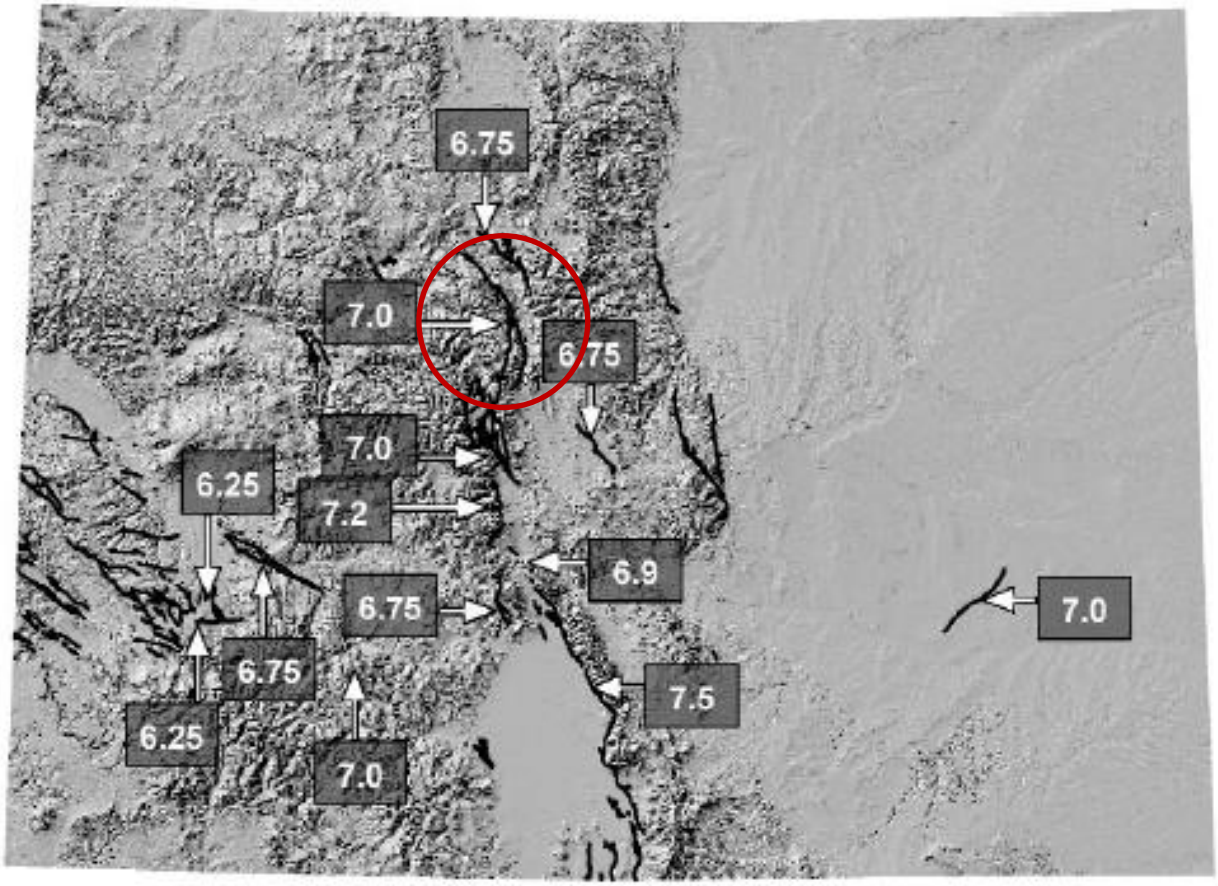
Geologically young faults that displace sediments or rocks deposited during the Quaternary Period (approximately past 2 million years).

- Known or suspected fault with displacement of late Quaternary deposits (approximately past 130,000 years)
- Known or suspected fault with displacement of middle to early Quaternary deposits (approximately past 130,000 to 2 million years old)

Source: Excerpt from Colorado Geological Survey;
Note: legend may not match map scale. Earthquakes shown on map are in the 3-3.9 and 4-4.9 M range

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.

Figure 3.9. Potentially Active Faults in Colorado with Maximum Credible Earthquake Determinations from the Colorado Geological Survey



Red oval is approximate location of Summit County (Source: CGS RockTalk Pub Volume 5, No. 2 April 2002)

Previous Occurrences

Colorado Earthquake Information 1867-1996 from the Colorado Geological Survey features the following two earthquake events in the planning area.

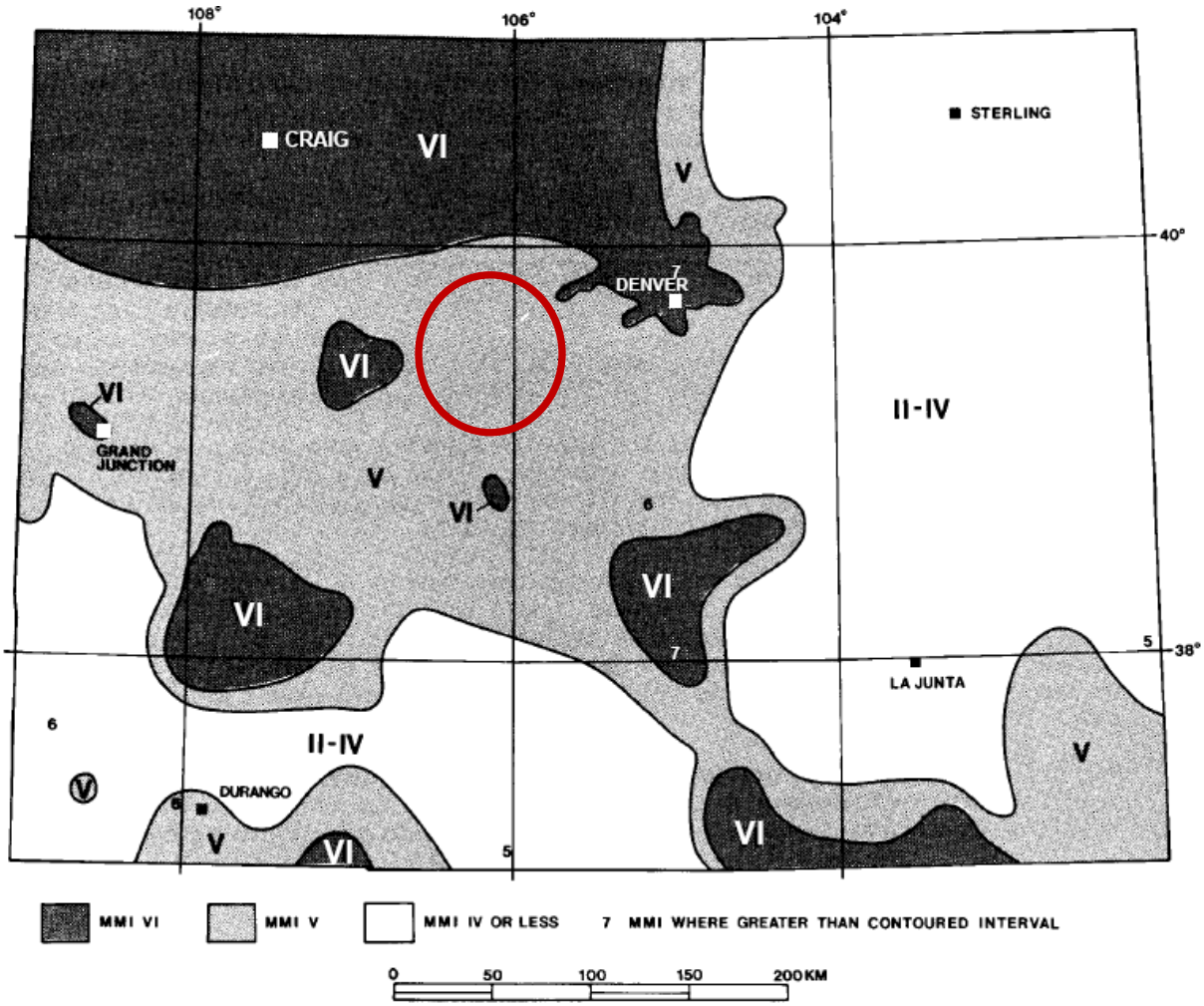
- **September 12, 1990**—A magnitude 3.0 earthquake with an epicenter in Vail caused intensity V shaking in Vail, Frisco, and Minturn and intensity III shaking in Silverthorne.
- **August 4, 1964**—A magnitude 4.0 earthquake had an epicenter northeast of Dillon.

Note: The third earthquake in Figure 3.8 that appears to be in or near Summit County was actually the result of a blast from mining operations in Climax.

Maximum historical earthquake Intensities felt in Colorado are shown in Figure 3.10. This map shows that 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.

Figure 3.10. Maximum Historical Earthquake Intensities in Colorado



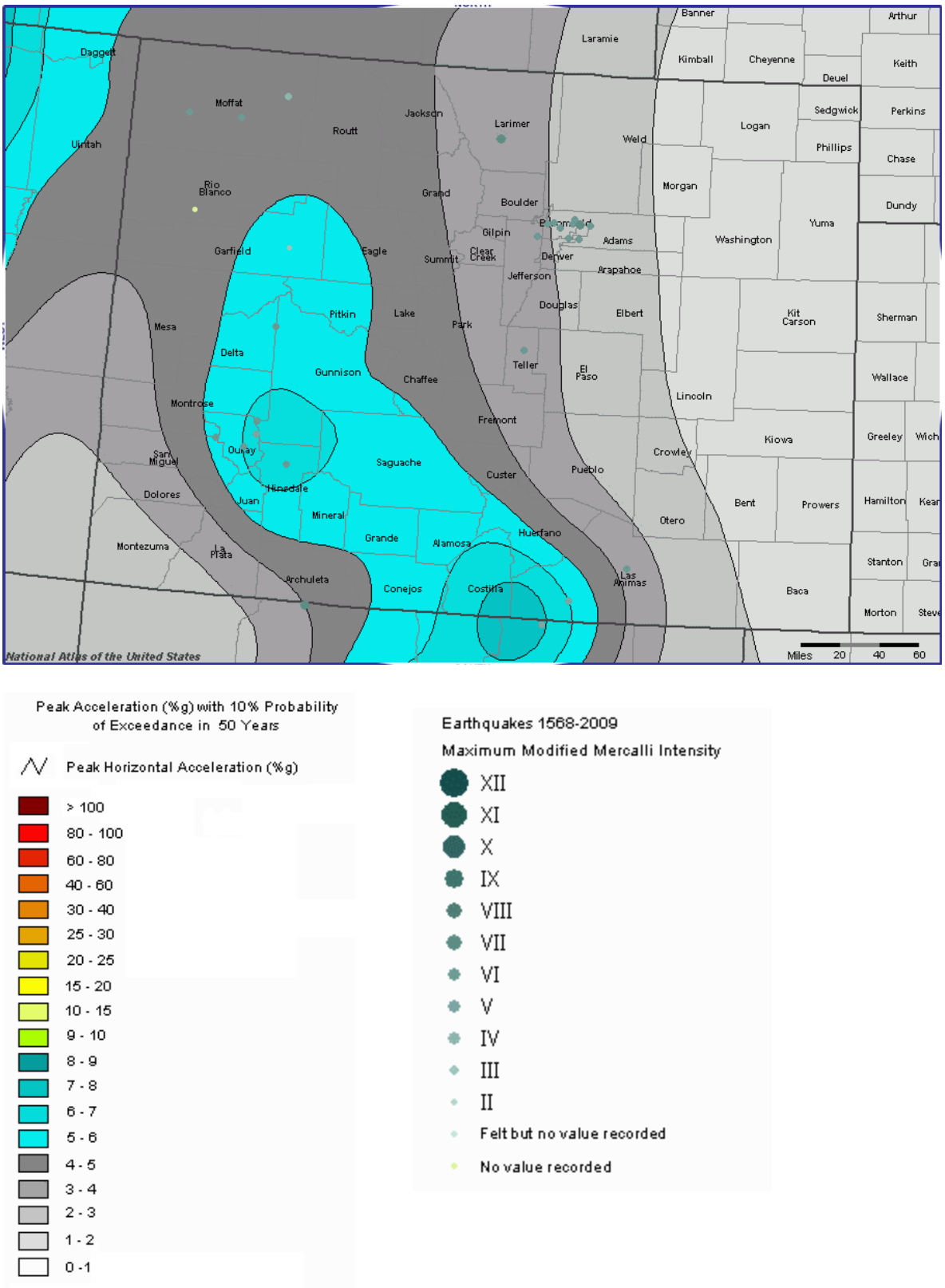
Source: Colorado Earthquake Information, 1867-1996, Colorado Geological Survey; Red oval indicates approximate location of Summit County

Probability of Future Occurrence

Occasional—1-10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years

Figure 3.11 is a probabilistic seismic hazard map of Colorado from the U.S. Geological Survey that depicts the probability that ground motion will reach a certain level during an earthquake. It shows the shaking level that has a 10% chance of being exceeded over a period of 50 years (as well as earthquakes in Colorado between 1568 and 2009).

Figure 3.11. Colorado Seismic Hazard Map—10% Probability of Exceedance in 50 Years



Source: USGS, www.nationalatlas.gov

Two small events in the County in the last 130 years, equals one event every 65 years, or a 1.5% chance in any given year. Although neither were damaging events, the occurrence of earthquakes is relatively infrequent in Colorado and the historical earthquake record is relatively short (roughly 130 years). The earthquake hazard in Colorado is 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. A M 5.3 earthquake and resulting aftershocks damaged homes west of Trinidad, Colorado on August 2, 2011, the largest earthquake since 1967. That same day a very rare M 5.8 earthquake struck Virginia, damaging buildings in Washington, D.C. and rattling the East Coast.

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

As shown in Figure 3.11, the shaking level that has a 10% chance of being exceeded over a period of 50 years is in the range of 3 to 5% peak acceleration in Summit County. Western Summit County lies in the range of 4-5% peak acceleration of gravity (the fastest measured change in speed for a particle at ground level that is moving horizontally because of an earthquake), and southeastern Summit County lies in the range of 3-4% peak acceleration. Thus, western Summit County has a greater earthquake risk. Significant earthquake damage typically does not occur until peak accelerations are greater than 30%.

A 2,500 year probabilistic HAZUS earthquake scenario was performed as part of this mitigation plan's update in 2013 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. According to this probabilistic scenario, there is the potential for 6% of the total number of buildings in the County to be affected, with roughly 943 buildings experiencing at least moderate damage. This analysis is discussed in greater detail in Section 3.3.3 as well as other deterministic analyses performed by the CGS. The CGS is in the process of updating the HAZUS analyses, but new information was not available to include in the plan during the 2013 update. While the impacts of a large quake could have widespread impacts on the County, the low probability of this occurring resulted in the HMPC planning significance rating of low by the HMPC.

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."

While these are natural processes, 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.

Geographic Location

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

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. Highway maintenance changes may have mitigated these impacts, but future maintenance practice is unclear as Summit County changes from CDOT Region 1 to Region 3 in July 2013.

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.

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, 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.

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.

3.2.6 Flood

Hazard Description

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.

The area adjacent to a river 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. Other types of floods include general rain floods, thunderstorm generated flash floods, alluvial fan floods, dam failure floods (see Section 3.2.1), and local drainage floods. The 100-year flood is the national standard to which communities regulate their floodplains through the National Flood Insurance Program.

The potential for flooding can change and increase through various land use changes and changes to land surface. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining watersheds or natural drainage channels. These changes are commonly created by human activities. These changes can also be created by other events such as wildfires. Wildfires create hydrophobic soils, a hardening or "glazing" of the earth's surface that prevents rainfall from being absorbed into the ground, thereby increasing runoff, erosion, and downstream sedimentation of channels.

According to the Summit County Flood Insurance Study dated November 16, 2011, major stream flooding on Summit County streams is caused by snowmelt, which increases as temperatures rise. Snowmelt runoff generally reaches its peak in June and recedes to a normal flow by mid-July or August. Rains that occur prior to mid-June do not increase the streamflows appreciably. However, after peak runoffs have occurred and snowmelt begins to decrease, rainfall usually increases the runoff. Rains that occur in July and August have a greater potential for causing major flash flooding.

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. These summer rainstorms rarely cause floodflows.

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. An ice dam forms, blocking the channel and causing flooding upstream (FEMA, 2005).

Geographic Location

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

The Blue River Basin, which covers all of Summit County, is on the west side of the Continental Divide and feeds into the Colorado River at the Town of Kremmling in Grand County. The basin has a drainage area of 514 square miles and generally drains in a north to northwest direction. The basin width ranges from 21 miles at Dillon Reservoir to 9 miles at Green Mountain Reservoir. The topography is mountainous with larger rivers in deep broad valleys and smaller creeks in steep gullies. The basin is bounded by the Continental Divide on the east and south, from Loveland Pass to Fremont pass; 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.

The Upper and Lower Blue River are classified as high flood risks. The Upper Blue River threatens Breckenridge, and the Lower Blue River threatens Silverthorne. Ten Mile Creek, also classified as a high flood risk, threatens Frisco and Copper Mountain (from the State of Colorado Natural Hazards Mitigation Plan). Other notable streams in the County include Straight Creek and Soda Creek (around Summit Cove).

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.

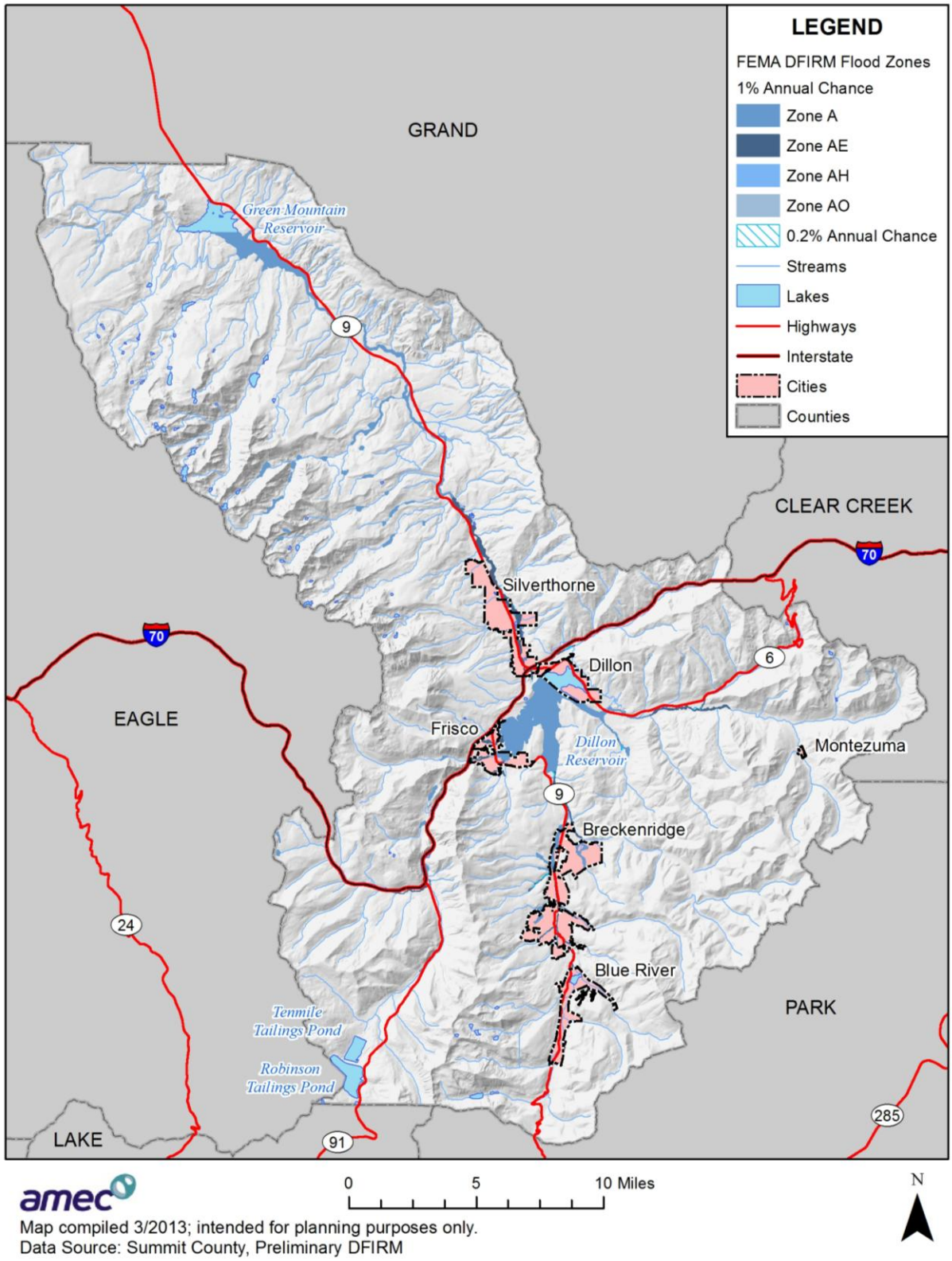
In Frisco, flooding along the Ten Mile and Meadow creeks normally occurs from May through September and results from snowmelt and/or intense storms.

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. Since the

Dillon Reservoir began operating in 1963, there have been no serious flood problems in Silverthorne.

With the exception of (incorporated) Dillon, every town in Summit County is at risk to riverine flooding. 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, 2011 FIS, the towns of Dillon and Montezuma do not have any Special Flood Hazard areas identified. The effective flood insurance rate map (FIRM) for the County was revised in 2001 and a complete digital version of this map (DFIRM) is in the final development stages. The County began the process to update FIRMs through FEMA's map modernization program in 2007. A preliminary version of the DFIRM was used during the 2013 update to refine the flood loss estimation. Figure 3.12 is a map of Summit County's preliminary DFIRM 100-year floodplain.

Figure 3.12. Summit County Flood Hazards Based on Preliminary DFIRM



amec

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, Preliminary DFIRM

Flood Protection Measures

The major flood protection measures in Summit County are Dillon Dam and Reservoir, which are just upstream from Silverthorne on the Blue River. The reservoir receives flows from the three principal basins in the County: Upper Blue River, Snake River, and Ten Mile Creek. The reservoir storage significantly reduces peak discharges and flood frequency and is also used to control discharges of the Blue River through Silverthorne to the Green Mountain Reservoir. The primary function of the Dillon Reservoir is collection and storage of 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 due to rainfall, but is only marginally effective for runoff due to snowmelt.

Other reservoirs in the Blue River basin above Breckenridge provide only incidental flood protection.

The recent changes that have been made in the Blue River Middle Branch channel through part of Breckenridge will significantly reduce 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.

No other structures such as dams, levees, canals, or other flood control devices were found to provide protection from the 1% annual chance flood event.

Previous Occurrences

According to the flood insurance studies and NCDC, there is little evidence of significant flooding in Summit County in recent years. Noted exceptions from the studies, NCDC, and the HMPC include the following:

- **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 NWS 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 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 Gold 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 has since been repaired with a culvert.
- **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.
- **July 17, 1965**—The largest recorded discharge on the Blue River, 1,250 cubic feet per second, resulted from snowmelt and a high-intensity storm centered over a tributary above Breckenridge. It had a return period of 50 years. Flooding in Breckenridge was caused by backwater from blocked culverts and bridges (many of the culverts have since been replaced).

The USACE Ice Jam Information Clearinghouse recorded 12 ice jam events in Summit County between 1955 and 2013. Affected rivers included the Blue River, Rock Creek, Snake River, and Keystone Gulch.

Probability of Future Occurrence

Likely—10-100% chance of 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 on FEMA FIRMs are often called the '100-year' flood zone, but really have a 1% annual chance of flooding any given year. The various FEMA zones are defined in Table 3.8. The blue shading on flood map figures in this plan represents different flood zones as defined by FEMA.

Table 3.8. FEMA Flood Zone Definitions and Probabilities

Zone	Definitions
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. The 'E" stands for Engineering Study and represents areas where base flood elevations have been determined. AE zones are now used on new format FIRMs instead of A1-A30 Zones.
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. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these flood zones.
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
Shaded Zone X or 0.2%	Areas with a 0.2% annual chance of flooding; also referred to as the 500 year floodplain.

Source: https://msc.fema.gov/webapp/wcs/stores/servlet/info?storeId=10001&catalogId=10001&langId=-1&content=floodZones&title=FEMA%2520Flood%2520Zone%2520Designations

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

In Summit County, floods can cause injuries and deaths. Flood water, as well as debris from steep tributary channels, can damage property and infrastructure and close roads. However, past flood damages have been limited.

3.2.7 Hazardous Materials Release

Hazard Description

Summit County is susceptible to accidents involving the transport of hazardous materials on County roads and highways. A hazardous material is any item or agent (biological, chemical, physical, radiological) that has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. An accident could occur at any time or as a result of a natural disaster. The release of hazardous materials can threaten people and natural resources in the immediate vicinity of the accident, including residences, resorts, and businesses along transportation routes.

Geographic Location

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.

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, as well as for the United States. 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.

At present, 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. Loveland Pass is also the boundary between Clear Creek County and Summit County. 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.

The 2012 reporting Tier II facilities in the RWBFPD response area include APC Concrete, Ferrellgas, CenturyLink (Breckenridge Central Office), and Breckenridge Ski Resort. The complete list of reporting Tier II facilities in the County is included in Table 3.9.

Table 3.9. 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	Lake Dillon Fire Protection District
CenturyLink Communications	Breckenridge	Red, White, and Blue Fire Protection District
CenturyLink Communications	Dillon	Lake Dillon Fire Protection District
Climax Mine	Summit County	Copper Mountain Fire Department
Comcast of Colorado V, LLC	Silverthorne	Lake Dillon Fire Protection District
Excel Energy	Silverthorne	Lake Dillon Fire Protection District
Ferrellgas	Frisco	Lake Dillon Fire Protection District
Keystone Ski Resort	Summit County	Lake Dillon Fire Protection District
Lowes	Silverthorne	Lake Dillon Fire Protection District
RSC Equipment Rental, Inc	Summit County	Red, White, and Blue Fire Protection District
UPS	Silverthorne	Lake Dillon Fire Protection District
Verizon	Summit County	Lake Dillon Fire Protection District
Vista Auto Group	Silverthorne	Lake Dillon Fire Protection District
Waste Management	Silverthorne	Lake Dillon Fire Protection District

Source: HMPC

Previous Occurrences

Hazardous materials incidents in Summit County have been relatively insignificant. Statistics from the National Response Center, which serves as the sole 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 2007, 40 transportation-related hazardous materials incidents were reported in Summit County. The majority of the incidents were related to gasoline and diesel fuel spills resulting from an accident (i.e., not from cargo). Seven of the events involved hazardous materials carriers (as identified in the reports). Spills from these events were largely gasoline. Forty-two events occurred between 2008 and 2012. This included 9 fixed events and 33 mobile events. Most incidents involved diesel and gasoline spills. Causes of the incidents included equipment failure, transportation accident, operator error, explosion, unknown, and other. Silverthorne was listed as the nearest city/town 15 times, nearly more than all the other nearest jurisdictions combined. Based on the recent 2008-2012 data, Summit County could expect an average of roughly 10 hazardous materials events each year.

On May 30, 2012 the Lake Dillon FPD 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.

On 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.

Lake Dillon FPD dealt with another hazmat transportation spill on November 10, 2010. 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.

On 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.

Another notable spill that involved hazardous cargo occurred on April 28, 2006, when 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.

In 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.

On 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 3.13. Lake Dillon FPD Responding to Lime Spill on Eastbound I-70

Source: Lake Dillon FPD

Figure 3.14. 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

Transportation-related hazardous materials incidents occur in Summit County every year. These are most often 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

Catastrophic—Multiple deaths; property destroyed and severely damaged; and/or interruption of essential facilities and service for more than 72 hours

Impacts in the past have been limited but depending on the type and quantity of spill and the medium affected, an event's magnitude and severity could become catastrophic. A hazardous materials release could cause personal injury or death to humans or damage to property or the environment. Humans are affected through inhalation, ingestion, or direct contact with skin. Air

releases can prompt large-scale population evacuations and spills into water or onto the ground can adversely affect public water and sewer systems.

According to a recent 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.

Population centers along I-70 and the hazardous materials bypass route on U.S. 6 are vulnerable to accidents involving hazardous materials. Damage to the environment and road closures due to accidents would negatively impact the tourism and recreation based economy.

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 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. 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, and rock falls occur commonly throughout Colorado, and the annual damage is estimated to exceed $3 million to buildings alone. California, Washington, and Colorado were the first three states to use federal disaster funds to acquire property in landslide hazard areas.

Geographic Location

The geographic extent of this hazard in Summit County is **isolated**—less than 10% of the planning area affected.

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 the County include Keystone Mountain (condos), 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, 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 hasn’t happened yet, there is a very real chance that a catastrophic slide could occur.

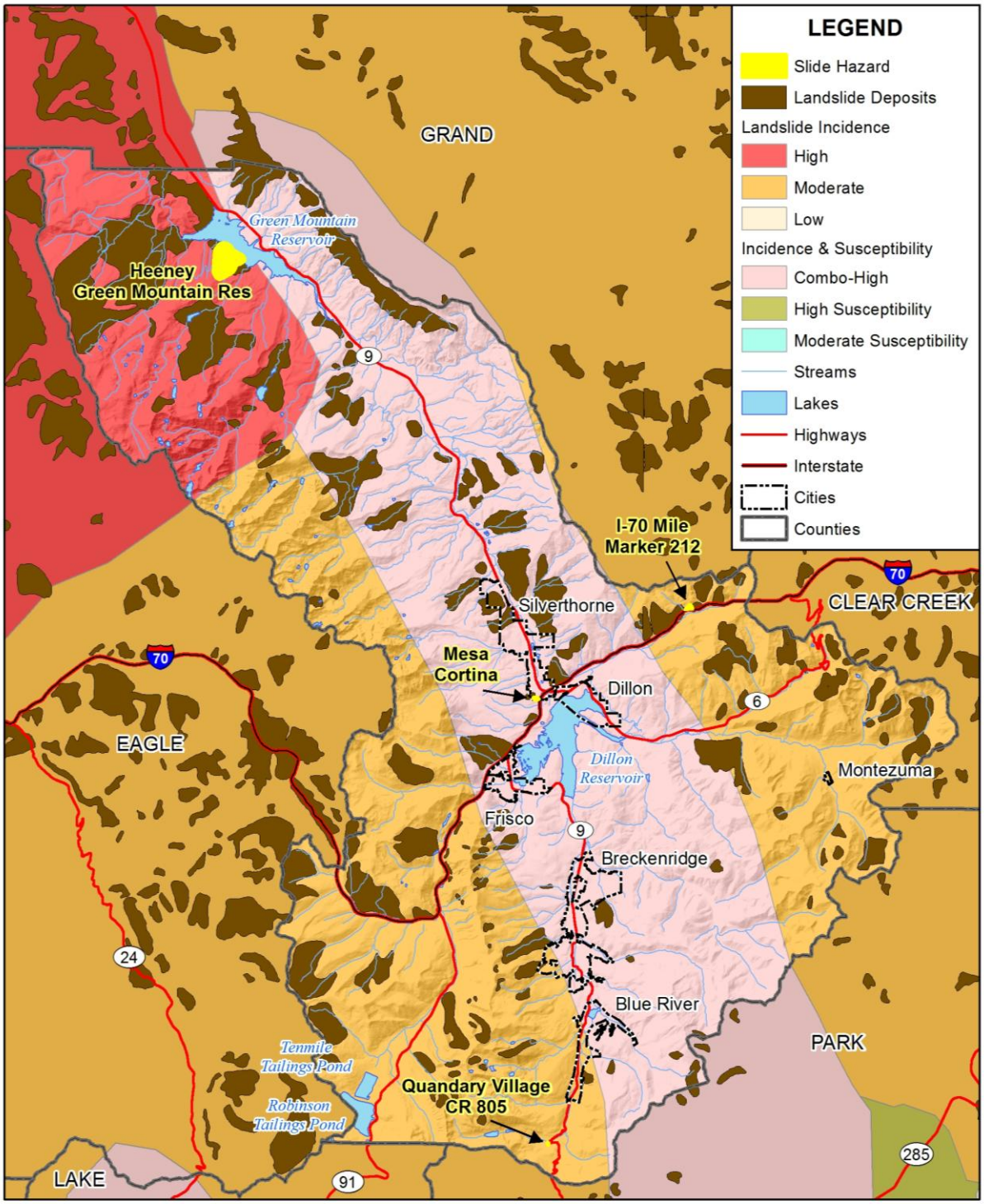
Long-term solutions to the problem would be extremely difficult and exorbitantly expensive to implement. The proposed solutions would necessitate closing that stretch of I-70 for several months and diverting traffic over Loveland Pass. Such a closure would be costly to the State's tourism and commerce 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 3.15 illustrates significant landslide hazard areas in Summit County. Additional areas of potential landslide risk were added during the 2013 update. These areas are based on a statewide map of landslide deposits originally mapped by the USGS.

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

Figure 3.15. Summit County Landslide Hazard Areas



0 5 10 Miles

N

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, U.S. Geological Survey, Colton/USGS Earth Data Analysis Center

Previous Occurrences

Previous occurrences of landslide hazards are not well known. 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.

A significant mudslide occurred in the Straight Creek drainage between the 212 and 212.5 mile markers along I-70 on July 6, 2011. 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 USFS 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 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 3.16 and Figure 3.17 show damages from the mudslide.

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.

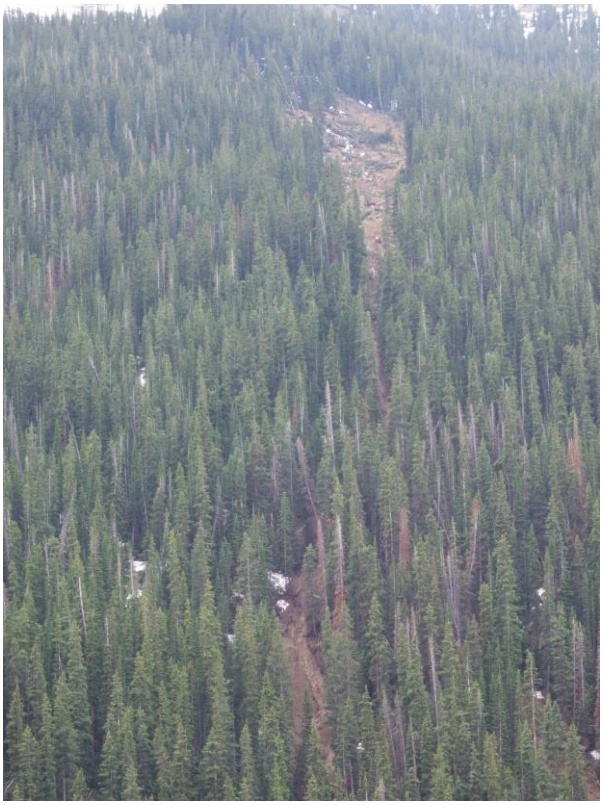
On May 24, 2010, a retaining wall on Little Beaver Trail in Dillon failed and collapsed onto the roadway. The roadway was blocked and closed for four months, though it was later reopened as a one-way road for 12 months. An impacted property owner was forced to delay their business opening for one year due to the slope failure event.

As noted previously, the slump on I-70 at mile marker 212, known as the “Big Bump,” is a slow, 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.

As noted previously, 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.

On 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.

Figure 3.16. July 6, 2011 Mudslide



Source: HMPC

Figure 3.17. Damage and Debris from July 6, 2011 Mudslide

Source: HMPC

Probability of Future Occurrence

Occasional—1-10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years

Based on the three 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; major or long-term property damage that threatens structural stability; and/or interruption of essential facilities and services for 24-72 hours

Landslide is a serious geological hazard that can threaten human life, impact transportation corridors and communication systems, and result in other infrastructure (e.g., reservoirs) and property damage. Actual losses can range from mere inconvenience 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 for water quality impacts.

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.

According to the National Lightning Safety Institute, lightning causes more than 26,000 fires in the United States each year. The institute estimates property damage, increased operating costs, production delays, and lost revenue from lightning and secondary effects to be in excess of $6 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.

Geographic Location

The geographic extent of this hazard in Summit County is **large**.

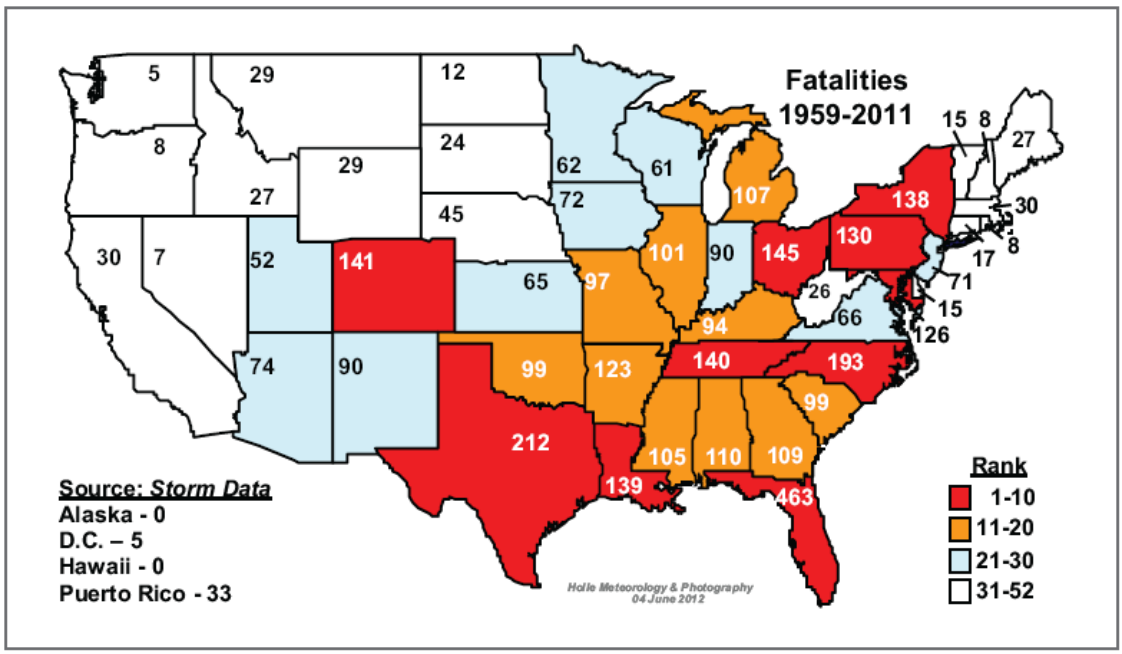
Lightning can occur anywhere in the County.

Previous Occurrences

Data from the National Lightning Detection Network ranks Colorado 32nd in the nation (excluding Alaska and Hawaii) with respect to the number of cloud-to-ground lightning flashes with an average number of 517,539 flashes per year (based on data collected between 1997 and 2011). Summit County has an average of 1,700 cloud-to-ground lightning flashes per year.

Figure 3.18 shows state-by-state lightning deaths between 1959 and 2011. Colorado ranks fourth for the number of deaths at 141. Florida (463), Texas (212), and Virginia (193) were ranked higher. From 2002 to 2011, Colorado ranked second in lightning fatalities with 24 deaths. Florida again ranked first with 56 deaths. Fifiteen lightning deaths occurred in Colorado between 2006 and 2012. None of these were in Summit County. In an average year in Colorado, 3 people are killed and 13 are injured.

Figure 3.18. Lightning Fatalities in the United States, 1959-2011



Source: National Weather Service, www.lightningsafety.noaa.gov/

While lightning is a regular occurrence in Summit County, damaging lightning is not. According to the National Climatic Data Center Storm Event Database, there were five notable lightning events in Summit County between 1997 and December 2012:

- **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 Gold 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.

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 highly likely that lightning will occur every year in Summit County, but not all will be damaging. In the last 15 years, the County experienced five damaging lightning events. This averages to a damaging lightning event every three years, or roughly a 33% chance of an event in any given year.

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

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.

3.2.10 Mountain Pine Beetle Infestation

Hazard Description

The lodgepole pine forests of Summit County are in the midst of a mountain pine beetle epidemic that has spread from Canada down the length of the Rocky Mountains. The resulting tree mortality presents a number of hazards. While wildfire is discussed in further detail in a subsequent section, it is here addressed as it relates to the changing forest conditions subsequent to this epidemic.

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. Beetle epidemics are a natural part of forest ecosystems, but 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 post mortem, the dead stems become increasingly susceptible to rot and blow-down.

Lodgepole pine stands are bearing almost the entirety of the current beetle epidemic in Summit County. Lodgepole forests lack diversity of age and species, with stands dominated by lodgepole pine of the same age. A disturbance, such as a fire followed by erosion, clears the land. This provides sunlight and site preparation required for lodgepole regeneration. A dense stand of lodgepole emerges and crowds out other species. These stands eventually become crowded, old, and ripe for a new disturbance. The fire return interval for this species is extremely variable, but is generally 25 to 75 years in stands experiencing mixed severity fire and 100 to 300 years in stand replacement fire regimes (Anderson 2003, Arno and Fielder 2005). In the absence of fire, insect infestation may assume this perturbation role. The shallow rooted lodgepole depend on the collective shelter of the stand. Even partial mortality within a stand can leave the remaining trees susceptible to blow-down in high winds.

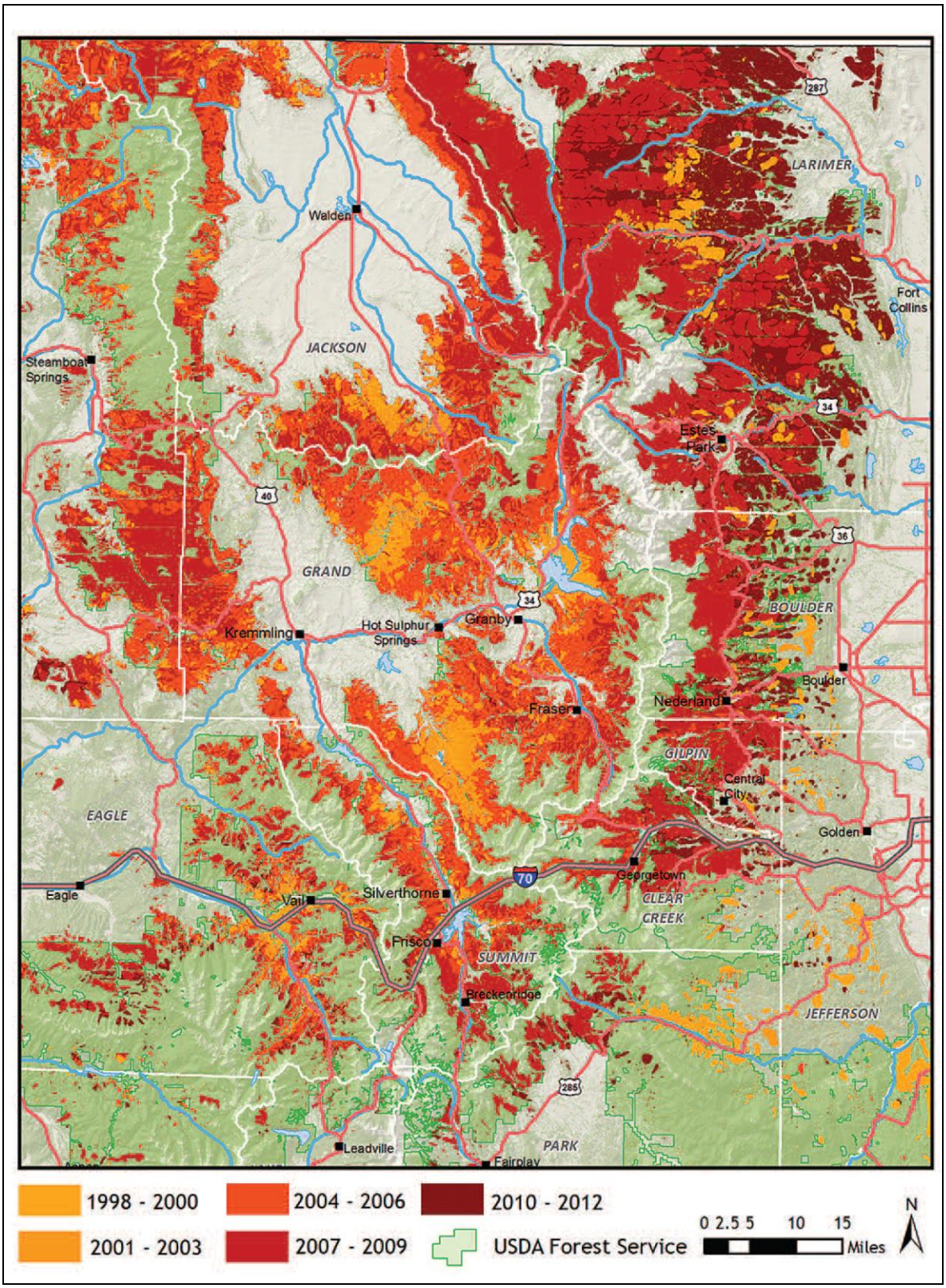
Geographic Location

While mountain pine beetle will attack a variety of pine trees, the epidemic in Summit County is almost entirely limited to lodgepole pine which comprise approximately 60% of the forested lands within the county. All of these stands have been impacted by the epidemic with mortality rates expected to exceed 75% of mature lodgepole pine (Berwyn 2011).

Various studies suggest different limits to pine beetle activity in lodgepole pine such as stands with basal areas below 100 sq. ft. per acre, elevation over 10,000 feet, and stands where the average diameter at breast height is <8 inches (Amman et al. 1977). The current epidemic in Summit County has challenged these preconceptions to the point that most lodgepole pine stands were impacted (Costello and Howell 2007).

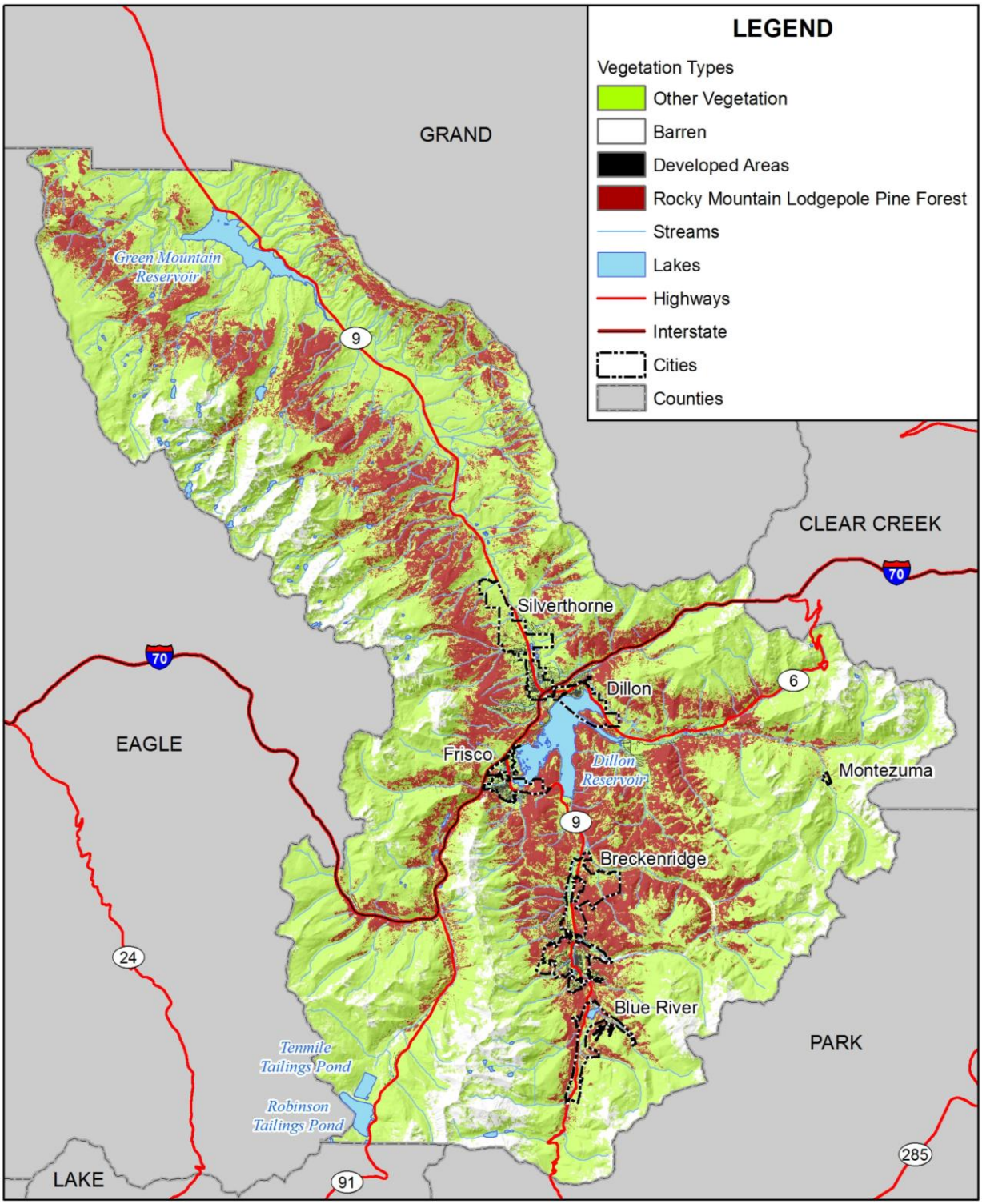
Figure 3.19. Mountain Pine Beetle Infestation of Lodgepole Pine in the Ute Pass Area

Figure 3.20. Mountain Pine Beetle Progression: 1998-2012



Source: Colorado State Forest Service, *2012 Report on the Health of Colorado's Forests*

Figure 3.21. Lodgepole Pine Forests in Summit County



Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, LANDFIRE

Previous Occurrences

While this is the second outbreak of mountain pine beetle in the past thirty years, the scale and severity of the current mountain pine beetle epidemic is unprecedented within the past several centuries. Forest ecologists are unable to say whether or not epidemics of this scale have ever occurred previously.

At its peak in 2008, this epidemic impacted over a million acres of Colorado's forests. As of 2012 over three million acres have been infested statewide In 2012 mountain pine beetle activity in Colorado declined for the fourth consecutive year as food sources become depleted in many areas of the state. Having reached a peak of over one million acres of active infestation in 2008, there were 264,000 acres of active infestation detected in 2012. This brings the total impacted area in Colorado 3,400,000 acres since the epidemic began in 1996 (CSFS 2013).

Probability of Future Occurrence

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

Mountain pine beetle 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.

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 Mountain Pine Beetle is unlikely to cause deaths or injuries or significant damage to property and infrastructures, it is killing millions of trees each year. The forest mortality resulting from this 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.

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 Ohio in 2003 caused the largest electrical outage in United States history, directly impacting an estimated 50 million people and causing billions of dollars in economic losses. In 2010 a multi-forest environmental assessment paved the way to allow for clearance of hazardous trees around power lines, but the implementation schedules rest with the individual utility operators.

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 the Mountain Pine Beetle (MPB) epidemic will greatly increase the amount of dead biomass in lodgepole forests, but predictions that this translates into an immediately drastic increase in the fire hazard is an oversimplification. The cycle is nuanced and complex, and a variety of fuel profiles and fire concerns will emerge. Predicted changes in fuel loads and fire behavior are discussed in more detail in the following section on Probability of Future Occurrence and Conditions.

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 post mortem. 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.

Figure 3.22. Moderate Load Conifer Litter (Fuel Model TL3) Near Breckenridge Prior to Beetle Infestation

Figure 3.23. High Load Conifer Litter (Fuel Model TL5) Near Breckenridge Following Beetle Infestation

Figure 3.24. Very High Load Timber and Shrub (Fuel Model TU5) as a New Cohort of Pine is Released

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 January and February and record minimum temperatures have fallen to -66°F. The average minimum temperatures are 0.6°F in Dillon and 0.7°F in Breckenridge.

Geographic Location

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

Winter weather can occur throughout Summit County.

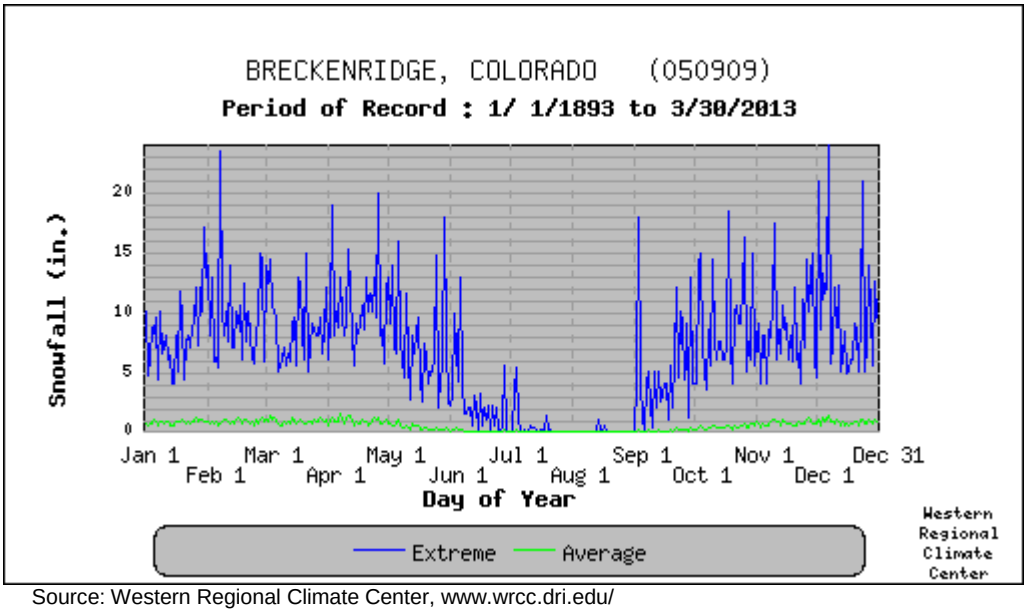
The Western Regional Climate Center reports data from weather stations in and around Summit County. The data reported here are from three of the stations: Breckenridge, Dillon, and Green Mountain Dam. Table 3.10 contains winter weather summaries for the three stations and illustrates differences within the County. Figure 3.25 through Figure 3.30 show daily snowfall and temperature averages and extremes.

Table 3.10. Summit County Winter Weather Summaries in Inches[1]

Station	Average Annual Snowfall	Snowiest Month/ Average Snowfall	Highest Daily Snowfall	Highest Monthly Snowfall	Highest Seasonal Snowfall	Average Snow Depth	Winter[2] Average Minimum Temp.	Minimum Temp.	# Days <32°F/ Year
Breckenridge[3]	163.6	Mar./23.6	20.9 12/24/1983	94.10 Dec. 1983	292.6 1996	7.0	0.7°F	-66°F 3/2/1895	290.2
Dillon[4]	126.4	Mar./21.7	24 4/9/1944 4/15/1921	73.3 Feb. 1936	261.5 1951	7.0	0.6°F	-46°F 12/24/1924	290.6
Green Mountain Dam[5]	73.7	Jan./13.5	24 11/8/1985	57.5 Jan. 1980	135.6 1979	9.0	5.7°F	-46°F 2/7/1989	229.8

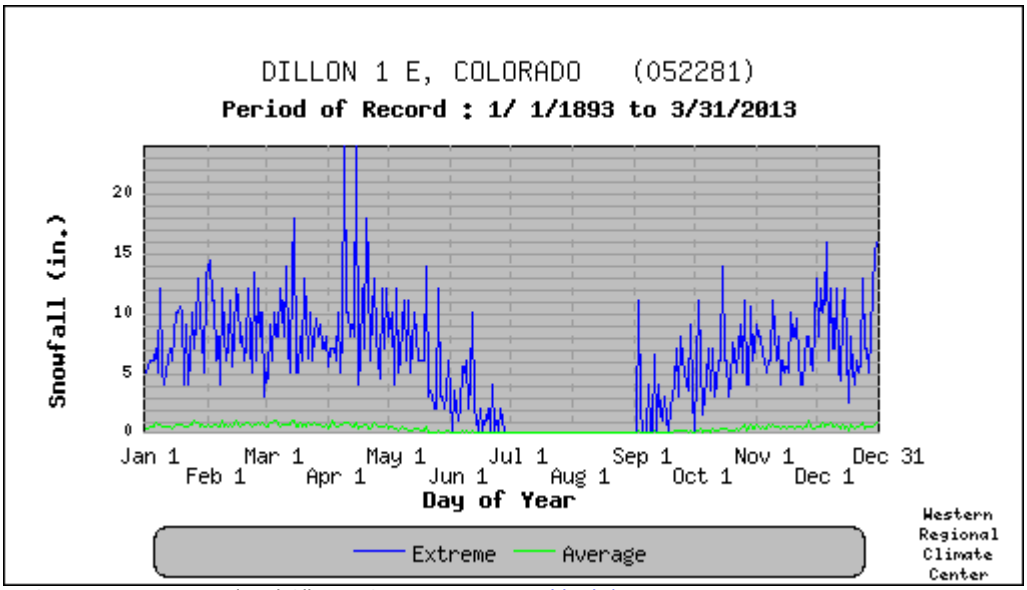
Source: Western Regional Climate Center, www.wrcc.dri.edu/
[1]All snowfall and snow depths are reported in inches
[2]Winter: December, January, February
[3]Period of Record: 1/1/1893-9/30/2012
[4]Period of Record: 1/1/1893-9/30/2012
[5]Period of Record: 7/1/1939-9/17/2012

Figure 3.25. Breckenridge Station Snowfall Averages and Extremes: 1893-2012



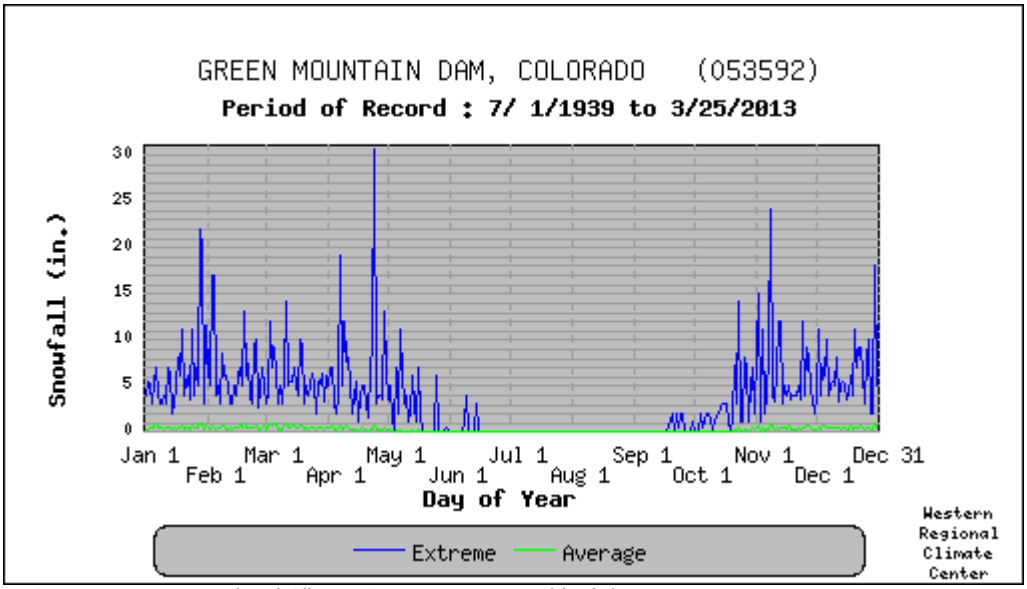
Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 3.26. Dillon Station Snowfall Averages and Extremes: 1893-2012



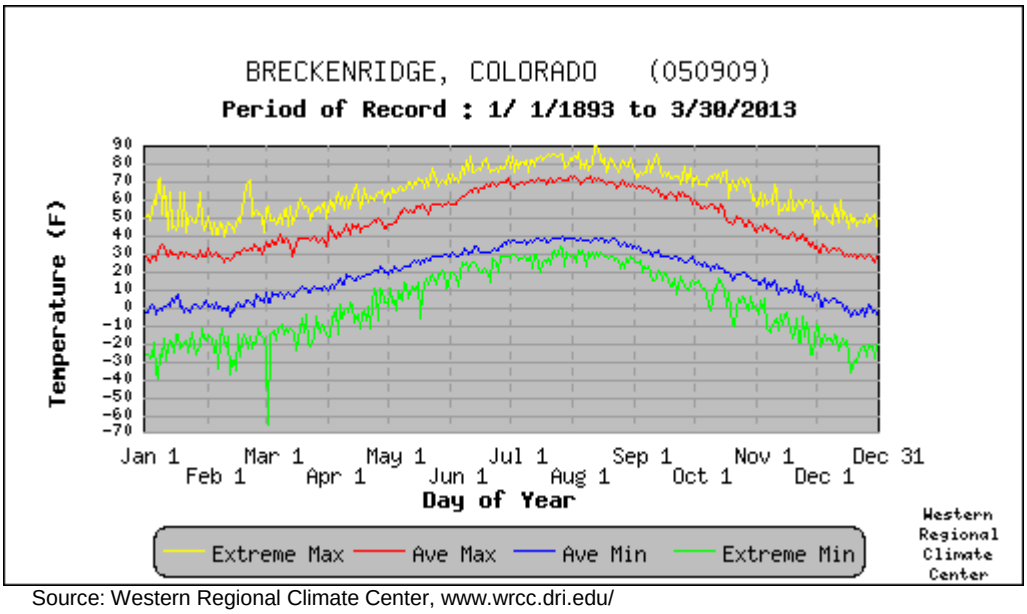
Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 3.27. Green Mountain Dam Station Snowfall Averages and Extremes: 1939-2012



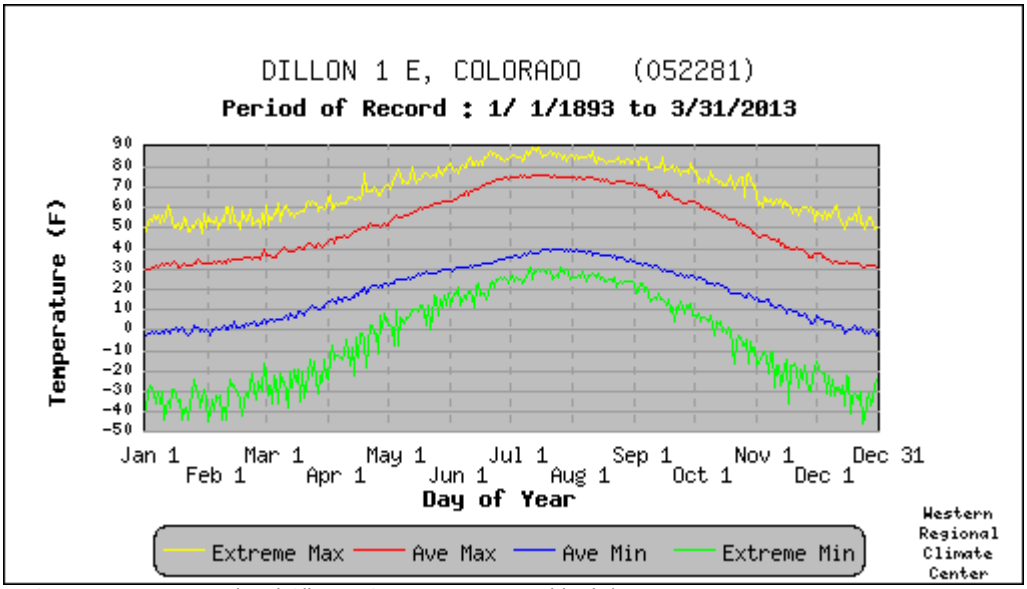
Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 3.28. Breckenridge Station Temperature Averages and Extremes: 1893-2012



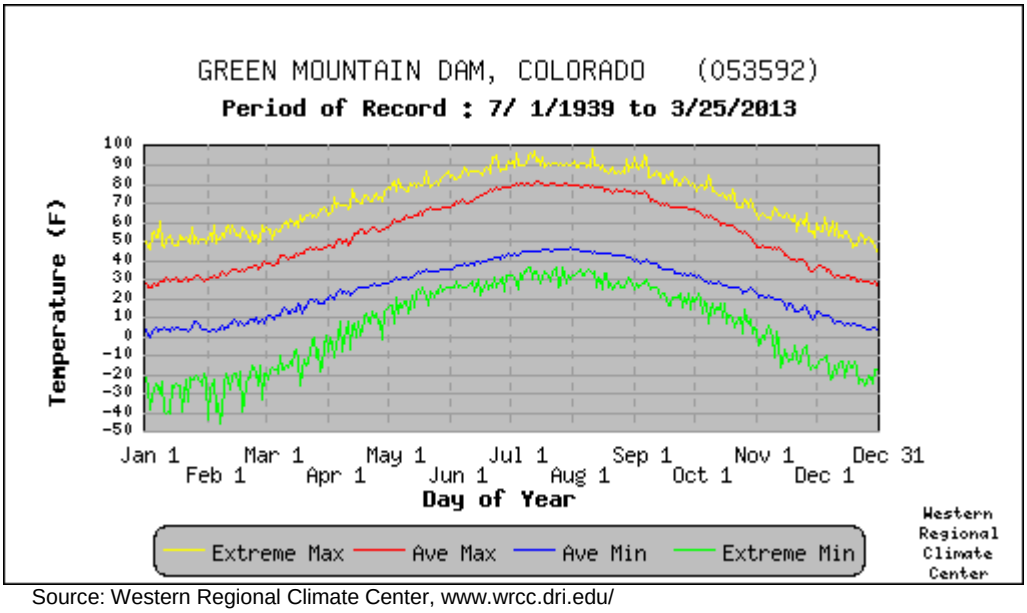
Source: Western Regional Climate Center, www.wrcc.dri.edu/

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

Historical data from SHELDUS and the National Climatic Data Center Storm Events Database was combined to determine that there were roughly 67 recorded winter weather events in Summit County between 1960 and 2012. 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 winter weather events in both SHELDUS and the National

Climatic Data Center Storm Events database are total damages for all counties associated with an event. Specific Summit County losses are not available.

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.

- **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 snow storm 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.

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 67 recorded winter weather events in Summit County between 1960 and 2012. On average, there are 1.3 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.

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 2013) as forested areas within town boundaries, an area extending ½ mile beyond town boundaries, and includes significant developments in unincorporated Summit County The Wildfire Protection Plan 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 or grass and low shrubs, or crown fires. Crown fire moves through the canopy of trees or shrubs and can be further classified as active or passive. Passive crown fire, often called “torching”, ignites individual or small groups of trees. 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.

- **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 as 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.

Wildfires are of significant concern 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 Natural Hazards Mitigation Plan, a century of aggressive fire suppression combined with cycles of drought and changing land management practices has left many of Colorado's forests unnaturally dense and ready to burn. Further, the threat of wildfire and potential losses are generally increasing as human development and population increases and the wildland-urban interface expands.

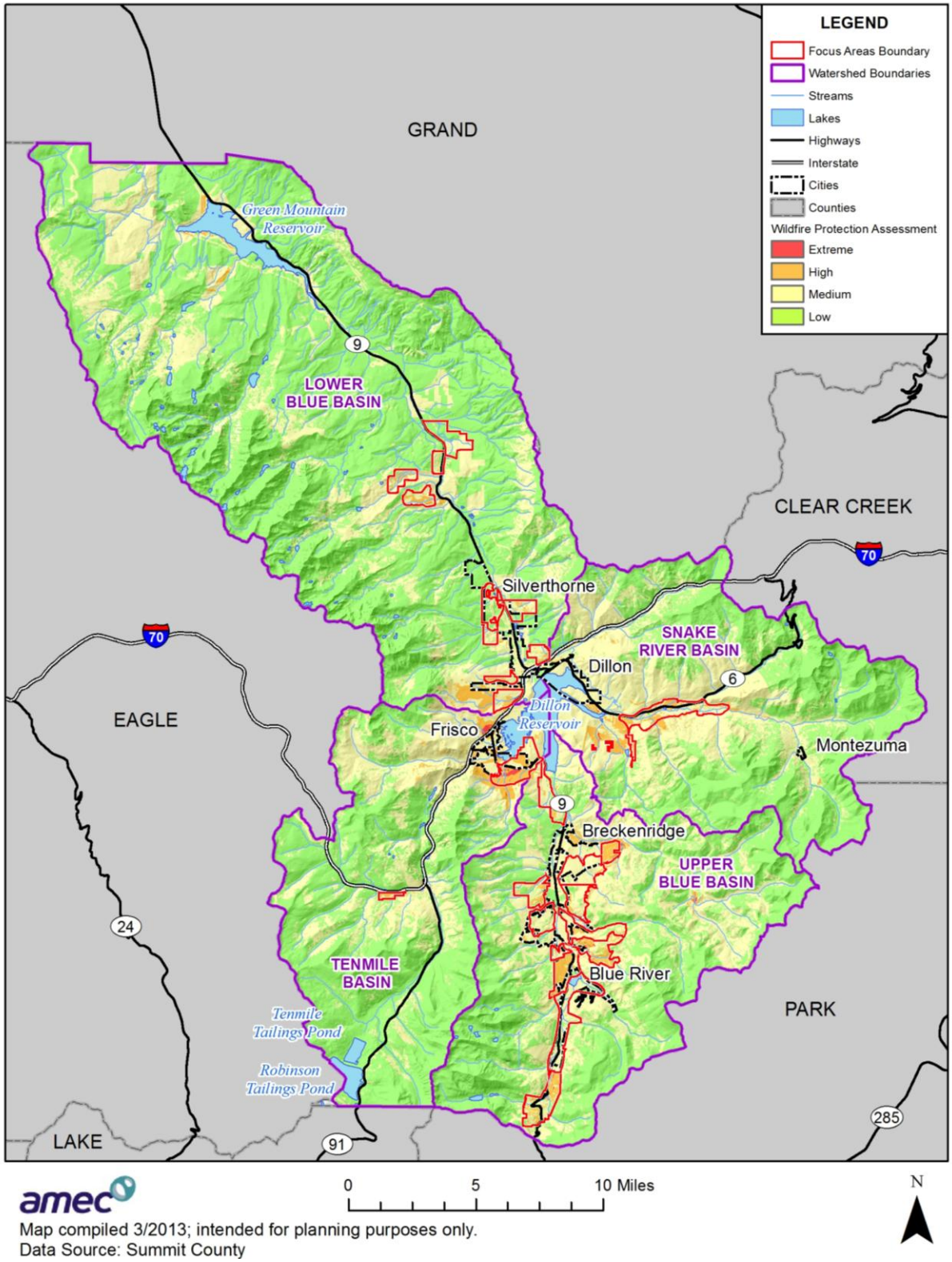
Geographic Location

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

With 80% of the County's 386,000 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 growing by nearly 19% between 2000 and 2010, 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 is shown below in the wildfire threat map, also referred to as the Community Protection Assessment in the CWPP. Within the high risk areas, the plan identified specific "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 and on more detailed maps in the jurisdictional annexes.

Figure 3.31. Summit County Wildfire Threat



Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County

Table 3.11. Acreage in Wildfire Threat Zones by Jurisdiction

Jurisdiction	Low		Medium		High		Extreme		Total Acres
	Acres	% Total	Acres	% Total	Acres	% Total	Acres	% Total	
Blue River	420	29	1,042	71	10	0.7	-	-	1,471
Breckenridge	477	12	3,259	85	86	2	2	0.06	3,824
Dillon	102	7	1,374	93	7	0.5	-	-	1,482
Frisco	1	0.1	763	67	367	32	6	0.5	1,137
Silverthorne	1,652	64	927	36	13	0.5	-	-	2,591
Unincorporated Areas	258,730	67	118,291	31	7,504	2	249	0.06	384,774
Lake Dillon FPD	601,931	76	178,132	23	6,976	0.9	173	0.02	787,213
Lower Blue FPD	177,405	90	20,357	10	268	0.1	0.7	0.0003	198,030
Red, White, and Blue FPD	253,995	76	78,107	23	3,807	1.1	154	0.05	336,064
Total County	**261,381**	**66**	**125,654**	**32**	**7,986**	**2**	**257**	**0.07**	**395,278**

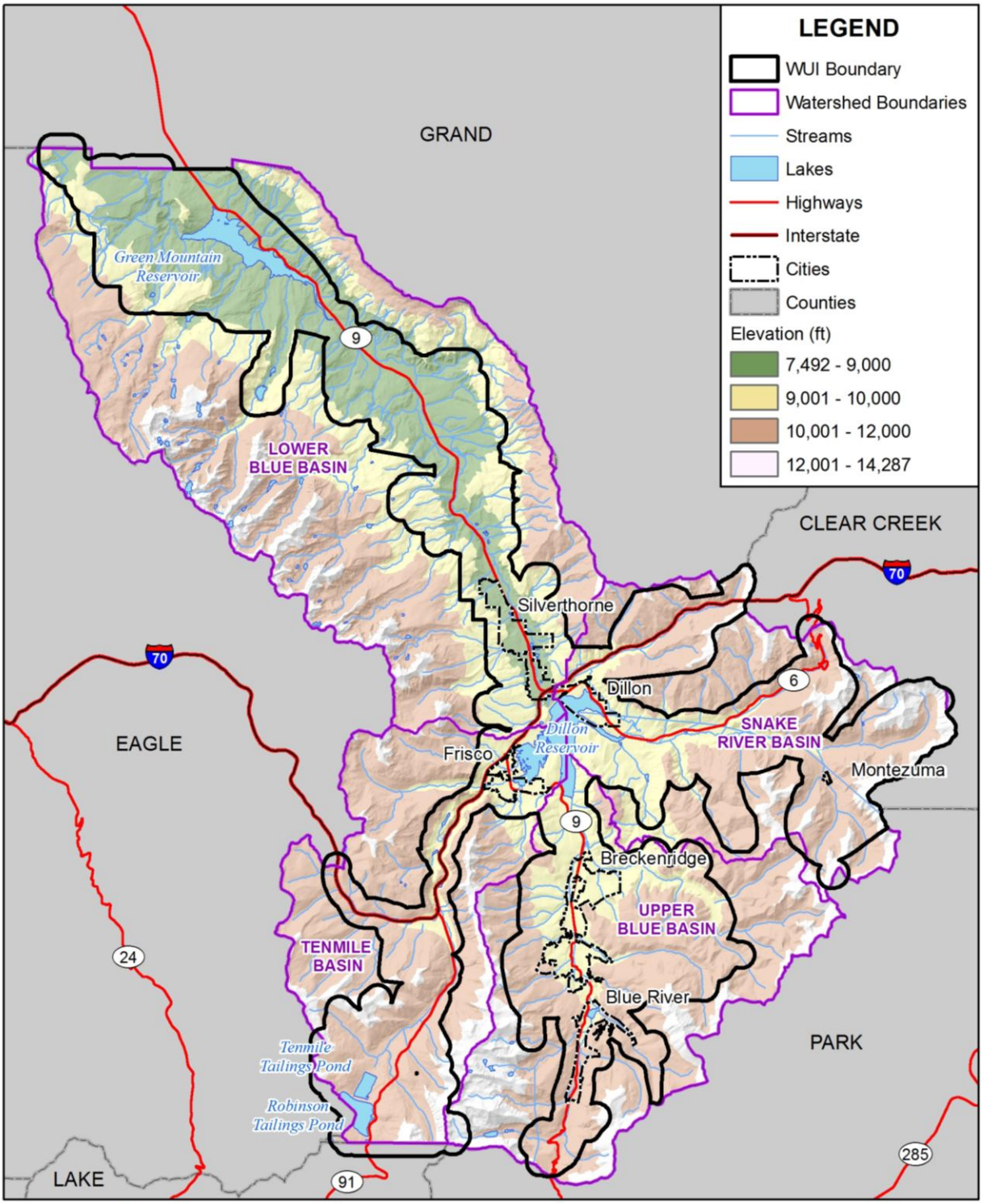
Source: Summit County
Notes: FPD=fire protection district

Based on the information presented in Table 3.11, unincorporated Summit County has the most acreage at risk to wildfire, with 126,044 acres (32.8% of the County's unincorporated acreage) in medium to extreme wildfire threat zones. Among the incorporated municipalities, Breckenridge has the most acreage at risk to wildfire; it is one of only two towns with acreage in the extreme fire threat zone (2 acres) and has 86 acres in the high threat zone and 3,259 acres in the medium threat zone. But, in regard to percent of total acreage in medium to extreme wildfire threat zones, Frisco (99.9%) and Dillon (93.2%) are more at risk than Breckenridge (87.5%).

Among the fire protection districts, the Lake Dillon Protection District has the most acreage at risk (185,281 acres in medium to extreme wildfire threat zones). In regard to percent of total acreage in medium to extreme wildfire threat zones, the Red White and Blue Fire Protection District has the most to lose, with 24.4% of its acreage in a medium to extreme wildfire threat zone. Overall, the County has 133,900 acres (34.07% of its acreage) in medium to extreme wildfire threat zones.

Figure 3.32 illustrates Summit County's wildland-urban interface which includes forested areas within town boundaries, extends ½ mile beyond town boundaries, and includes significant developments in unincorporated Summit County (Summit County Community Wildfire Protection Plan 2010).

Figure 3.32. Summit County Wildland-Urban Interface



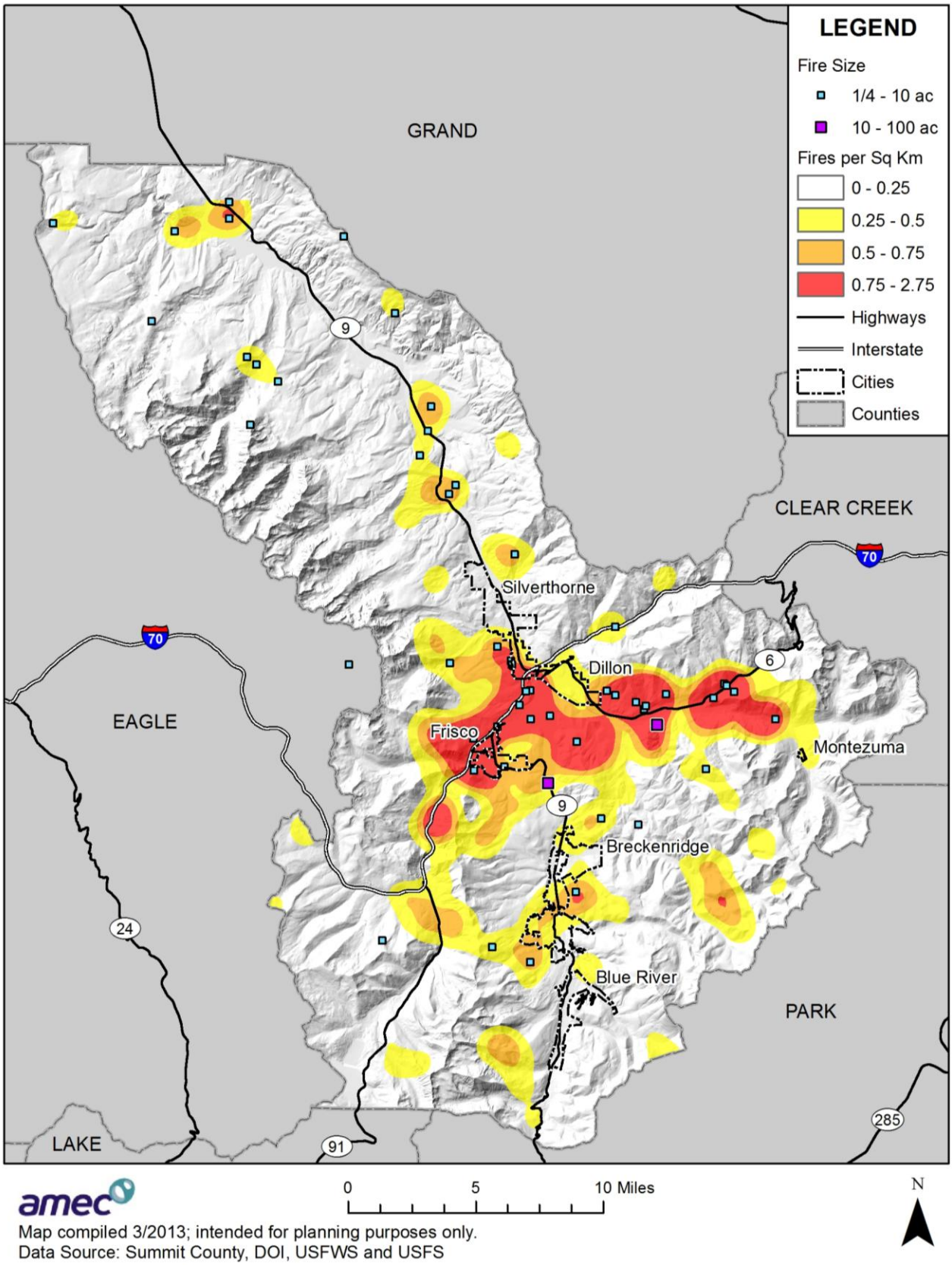
amec

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County

Previous Occurrences

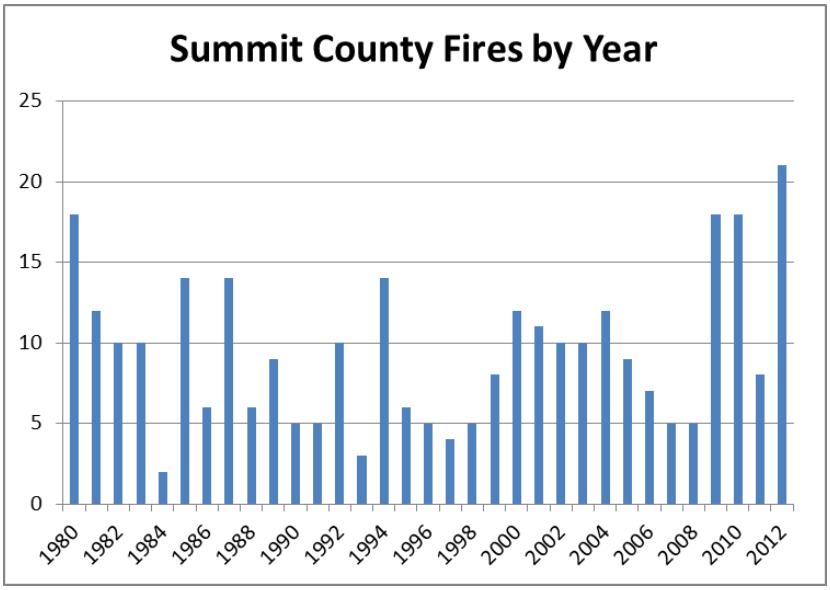
Wildland fire occurrence has been historically focused around the most populated areas in the center of the county. Over 80% of Summit County's wildfires since 1980 have remained smaller than a quarter of an acre. Fires between a quarter acre and ten acres have largely been concentrated in the same areas around the I-70 and Hwy 6 corridors (see the fire density map below). During this time period, only the Ophir and Gulch fires exceeded ten acres, and these were held to less than twenty acres. While there is no recent history of large fires, the potential impact of wildland fires in Summit County should not be underestimated. In June of 2012 a twenty acre fire in Estes Park destroyed twenty-one homes, illustrating the devastation that even a small fire can have in the WUI. In addition, many areas in Colorado and across the west are beginning to see fires of unprecedented size and intensity.

Figure 3.33. Summit County Wildfire Occurrence Density: 1980-2012



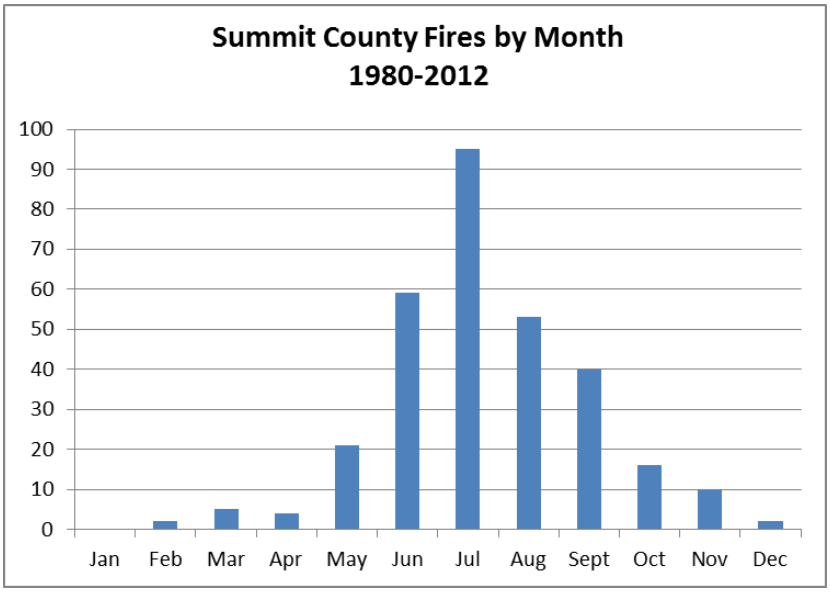
From 1980 through 2012, 299 Summit County fires were recorded in the Federal Wildland Fire Occurrence Data (http://wildfire.cr.usgs.gov) and an additional 16 were reported by local jurisdictions for a total of 315. Though averaging only 9.5 fires per annum, three of the last four years have ranked among the most active years with 18 to 21 fires. Eighty percent of fires were less than a quarter of an acre, and none exceeded 20 acres.

Figure 3.34. Summit County Fires by Year: 1980-2012



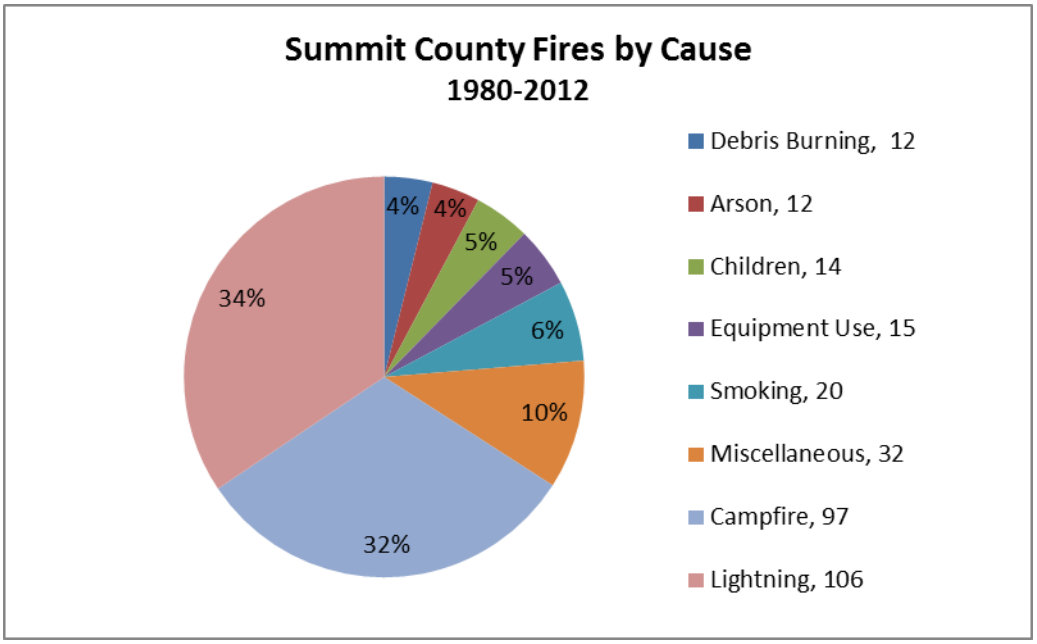
Summit County has a pronounced summer fire season that peaks in July. Over 80% of the fires occur from June through September.

Figure 3.35. Summit County Fires by Month: 1980-2012



Lightning was the most common cause of fire, closely followed by escaped campfires. Human caused fires account for 75% when totaled. Recent local fire records cite power line contact with trees, and juveniles as significant causes of fires in the WUI. These and other recent events are detailed further below. The locations of individual fires are mapped by their cause in Figure 3.37.

Figure 3.36. Summit County Fires by Cause: 1980-2012

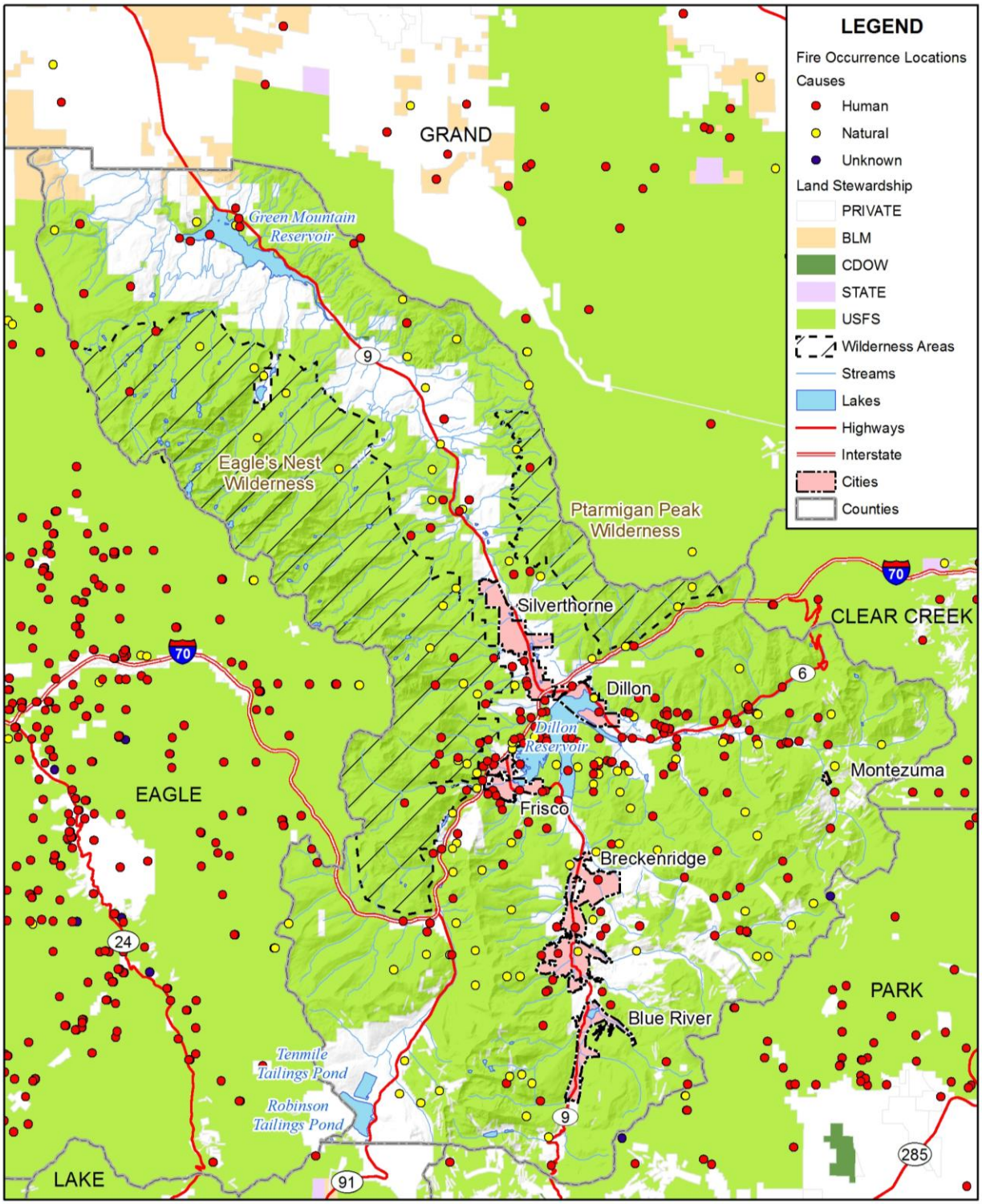


- **March 29, 2012 –** Power lines in high winds ignited a 2.7 acre fire on Denver Water Board lands near Keystone Ski Resort. Several homes were evacuated, access to the town of Montezuma was closed and watershed lands were potentially threatened.
- **June 2, 2011 -** The Gulch Fire (Lake Dillon Fire Protection District) 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.
- **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. The plan was still under development at the time of the fire. Southbound U.S. 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.

Figure 3.37. Summit County Wildfire Occurrence: 1980-2012



Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, COMaP v9, DOI, USFWS and USFS

Probability of Future Occurrence

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

With an average of 9.4 fires per annum, Summit County will continue to experience wildfires on an annual basis. Small fires are typical with 80% of fires since 1980 remaining smaller than a quarter acre and none exceeding 20 acres.

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; property destroyed and severely damaged; interruption of essential facilities and service for more than 72 hours

Potential losses from wildfire include human life; structures and other improvements; natural and cultural resources; the quality and quantity of the water supply; assets such as timber and range; and recreational opportunities; and economic losses. Smoke and air pollution from wildfires can be a severe health hazard. In addition, wildfire can lead to secondary impacts due to vegetation loss such as future flooding and landslides and erosion during heavy rains.

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.

In the mountains of Colorado, strong winds are also common throughout the winter months and can exceed 50 to 100 mph in exposed locations. Specifically, these winter winds can force the closure of highways (blowing snow) and contribute to avalanches (see Section 3.2.1 Avalanche and Section 3.2.11 Severe Winter Weather).

Geographic Location

The geographic extent of this hazard in Summit County is **large**—more than 50% 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 SHELDUS and the National Climatic Data Center Storm Events Database was combined to determine that there were roughly 49 recorded wind events in Summit County or its National Weather Service forecast zones (Zones 32 and 34) between 1955 and 2012. (Note: These wind events were reported as wind only 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 both SHELDUS and the National Climatic Data Center Storm Events database are total damages for all counties associated with an event. Specific Summit County losses are not available.

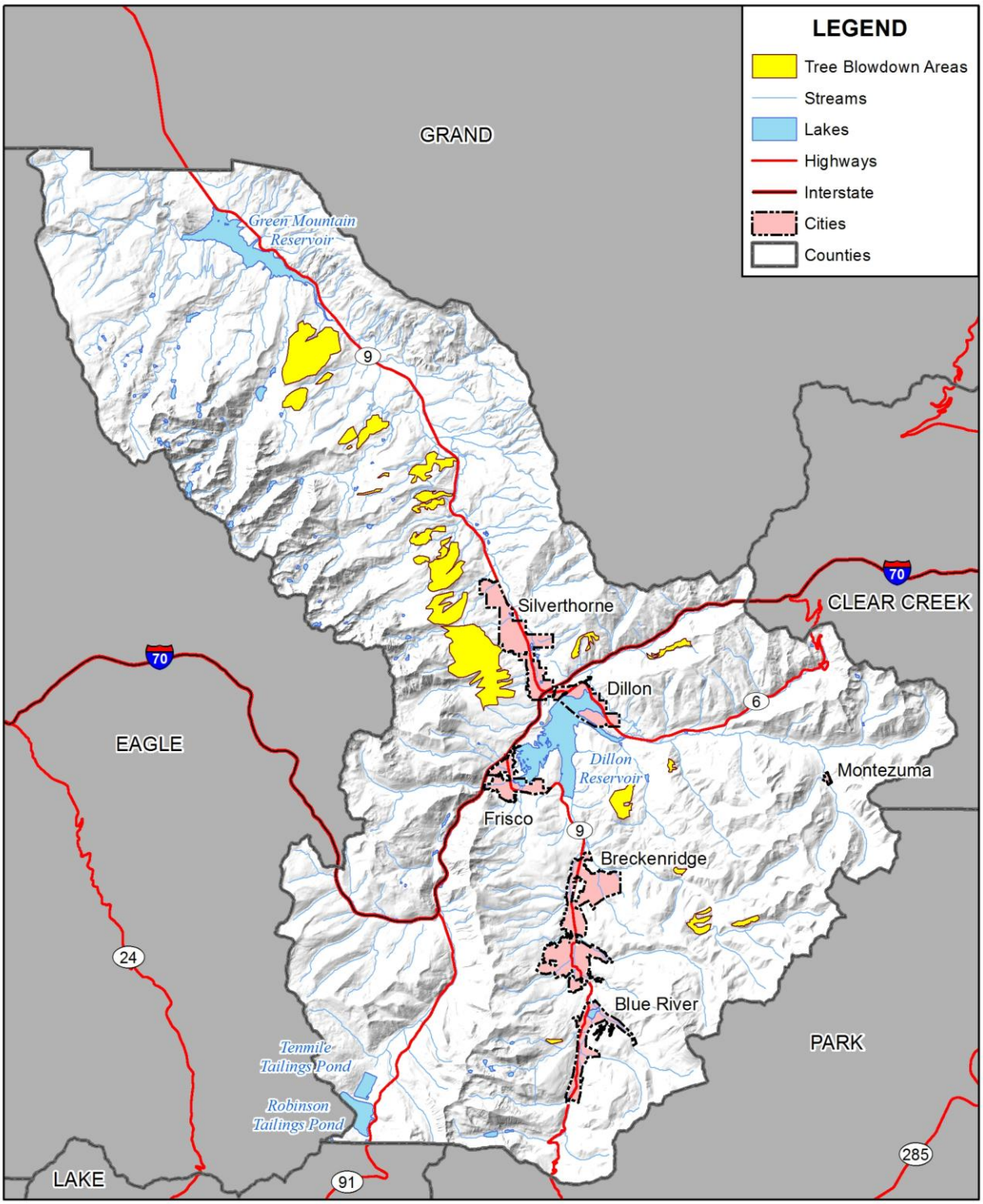
Notable events mentioned by the HMPC include the following:

- **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 wind storm 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 HMPC also reported that a microburst occurred in the Eagle's Nest Wilderness Area within Summit County in the last few years. Figure 3.38 depicts tree blowdown areas in Summit County.

Figure 3.38. Summit County Tree Blowdown Areas



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County

Probability of Future Occurrence

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

There were 49 significant recorded high wind events in the past 57 years in Summit County, which equals one wind event every 1.16 years on average, or an 85% chance of occurrence in any given year.

Magnitude/Severity

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

Wind storms 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.

3.2.14 Hazard Profiles Summary

This section summarizes the results of the hazard profiles 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. Those hazards determined to be of high and moderate significance were characterized as priority hazards that required further evaluation in Section 3.3 Vulnerability Assessment.

Table 3.12. Summary of Hazard Profiles

Hazard Type	Geographic Location*	Probability*	Magnitude*	Overall Vulnerability
Avalanche	Isolated	Highly Likely	Critical	High
Flood	Small	Likely	Critical	High
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Medium	Highly Likely	Catastrophic	High
Drought	Large	Likely	Limited	Moderate
Dam Failure	Small	Unlikely	Catastrophic	Moderate
Hazardous Materials Release	Isolated	Likely	Catastrophic	Moderate
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Occasional	Critical	Moderate
Lightning	Large	Likely	Critical	Moderate
Mountain Pine Beetle Infestation	Large	Highly Likely	Limited	Moderate
Earthquake	Large	Occasional	Limited	Low
Erosion/Deposition	Small	Likely	Limited	Low
Windstorm	Large	Likely	Limited	Low

Source: Summit County Hazard Mitigation Planning Committee, 2013
*See section 3.2 for definitions of these factors

The following tables summarize 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 3.13. Probability of Future Occurrence of Identified Hazards by Jurisdiction

Hazard Type	Summit County	Blue River	Breckenridge	Dillon	Frisco	Montezuma	Silverthorne
Avalanche	High Likely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Dam Failure	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Drought	Likely	Occasional	Occasional	Likely	Likely	Likely	Likely
Earthquake	Occasional	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Erosion/Deposition	Likely	Likely	Likely	Likely	Likely	Likely	Likely
Flood	Likely	Occasional	Likely	Unlikely	Likely	Likely	Likely
Hazmat Release	Likely	Unlikely	Unlikely	Occasional	Occasional	Unlikely	Occasional
Landslide, Mudflow/Debris Flow, and Rockfall	Occasional	Occasional	Occasional	Unlikely	Unlikely	Unlikely	Likely
Lightning	Likely	Likely	Likely	Likely	Likely	Likely	Likely
Mountain Pine Beetle Infestation	Highly Likely	Highly Likely	Highly Likely	High Likely	Highly Likely	Likely	Likely
Severe Winter Weather	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Highly Likely	Likely	Highly Likely
Wildfire	Highly Likely	Likely	Likely	Occasional	Occasional	Likely	Likely
Windstorm	Likely	Likely	Likely	Likely	Likely	Likely	Likely

*See Section 3.2 for definitions of these factors

Table 3.14. Magnitude/Severity of Identified Hazards by Jurisdiction

Hazard Type	Summit County	Blue River	Breckenridge	Dillon	Frisco	Montezuma	Silverthorne
Avalanche	Critical	Limited	Limited	Negligible	Negligible	Limited	Negligible
Dam Failure	Catastrophic	Catastrophic	Critical	Limited	Limited	Negligible	Catastrophic
Drought	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Earthquake	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Erosion/Deposition	Limited	Critical	Limited	Limited	Limited	Critical	Limited
Flood	Critical	Limited	Critical	Limited	Limited	Limited	Critical
Hazmat Release	Catastrophic	Limited	Critical	Critical	Critical	Limited	Critical
Landslide, Mudflow/Debris Flow, and Rockfall	Critical	Limited	Limited	Critical	Limited	Limited	Limited
Lightning	Critical	Limited	Critical	Critical	Critical	Critical	Critical
Mountain Pine Beetle Infestation	Limited	Limited	Limited	Limited	Limited	Critical	Limited
Severe Winter Weather	Critical	Critical	Critical	Critical	Critical	Critical	Critical
Wildfire	Catastrophic	Critical	Catastrophic	Critical	Critical	Catastrophic	Critical
Windstorm	Limited	Limited	Limited	Limited	Limited	Critical	Limited

*See Section 3.2 for definitions of these factors

Table 3.15. 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	Moderate	Moderate	Moderate	Low	Low	Low	High
Drought	Moderate	Low	Moderate	Low	Moderate	High	Moderate
Earthquake	Low	Low	Low	Low	Low	Low	Low
Erosion/Deposition	Low	Moderate	Low	Moderate	Moderate	Medium	Low
Flood	High	Moderate	High	Low	Moderate	Medium	High
Hazmat Release	Moderate	Low	Moderate	High	High	Medium	High
Landslide, Mudflow/Debris Flow, and Rockfall	Moderate	Low	Low	Low	Low	Low	Low
Lightning	Moderate	Low	Moderate	Moderate	Moderate	Medium	Moderate
Mountain Pine Beetle Infestation	Moderate	Moderate	Moderate	Moderate	High	High	Moderate
Severe Winter Weather	High	High	High	High	High	High	High
Wildfire	High	High	High	Moderate	High	High	High
Windstorm	Low	Low	Low	Moderate	Low	Medium	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, and other community assets at risk to natural hazards. The vulnerability assessment for this plan followed the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses* (2002).

The vulnerability assessment was conducted based on the best available data and the overall planning significance of the hazard. Data to support the vulnerability assessment was collected from the same sources identified in Section 3.1 Hazard Identification and Section 3.2 Hazard Profiles and from FEMA's HAZUS-MH ver. 2.0 loss estimation software.

The vulnerability assessment includes three sections:

- **Community Asset Inventory**—This section inventories assets exposed to hazards in Summit County, including the total exposure of people and property; critical facilities and infrastructure; natural, cultural, and historic resources; and economic assets.
- **Vulnerability by Hazard**—This section describes the County's overall vulnerability to each hazard; identifies existing and future structures, critical facilities, and infrastructure in identified hazard areas; and estimates potential losses to vulnerable structures, where data is available. Only hazards of moderate or high planning significance, or that have identified hazard areas are addressed in the vulnerability assessment.
- **Development and Land Use Trends**—The final section analyzes trends in population growth, housing demand, and land use patterns.

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, and plans that mitigate or could be used to mitigate risk to disasters. This information can be found in the annex for each jurisdiction.

3.3.2 Community Asset Inventory

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

Total Exposure to Hazards

Table 3.16 shows the total population, number of structures, and assessed value of improvements to parcels by jurisdiction. Building counts and values are based on county assessor's data (as of February 2013) and aggregated by town (includes building contents). According to the assessor's data, the sum of the actual value improvements in the County is $17,037,572,299 (total building exposure). Contents exposure is estimated as a percent of the improvement value (specifically, 50% of the improvement value for residential structures, 150% for industrial structures, 100% for agricultural structures, 100% for commercial, mixed use and government structures, 0% for vacant land), based on standard FEMA methodologies.

Table 3.16. Population and Building Exposure by Jurisdiction

Community	Population 2010	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Structure Value*
Blue River	849	895	673	$172,311,689	$272,173,284	$136,086,642	$408,259,926
Breckenridge	4,540	3,534	2,671	$1,111,714,782	$3,391,019,314	$1,953,973,424	$5,344,992,738
Dillon	904	573	460	$102,081,352	$430,076,465	$257,884,397	$687,960,862
Frisco	2,683	1,812	1,563	$361,284,397	$1,046,565,531	$591,881,365	$1,638,446,896
Montezuma	65	85	46	$8,278,991	$9,166,128	$4,583,064	$13,749,192
Silverthorne	3,887	2,116	1,596	$407,543,216	$752,258,269	$421,204,309	$1,173,462,578
Unincorporated Areas	15,066	10,647	7,458	$1,731,903,428	$4,741,653,918	$3,029,046,190	$7,770,700,108
Total	**27,994**	**19,662**	**14,467**	**$3,895,117,855**	**$10,642,912,909**	**$6,394,659,390**	**$17,037,572,299**

Source: Summit County Assessors Data, February 2013; 2010 U.S. Census
*Value represents "improved structure value" and includes contents. Does not include land value.

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 3.17 displays the inventory of critical facilities (based on available data) in Summit County as provided by the HMPC and Summit County GIS data. The County's GIS data did not identify any critical facilities in Montezuma. The locations of these facilities are shown in Figure 3.45 in the wildfire section of 3.3.3 Vulnerability by Hazard. Specific information on facilities and their locations can be found in the jurisdictional annexes. According to HAZUS-MH ver. 2.0 the total value of transportation and utility lifeline systems is estimated to be $822M and $581M respectively.

Table 3.17. Critical Facilities in Summit County

Facility Type	Unincorporated Areas	Blue River	Breckenridge	Dillon	Frisco	Silverthorne
Ambulance	3	-	-	1	-	-
Bridge	35	-	2	1	4	8
Communications	5	-	-	-	-	-
Dam	7	1	1	-	-	-
Emergency Operations Center	1	-	-	-	-	-
Fire Facility	3	-	-	-	-	1
Fire Lookout	23	-	3	-	1	1
Fire Station	2	1	3	1	1	-
Government Building	16	1	8	3	4	6
HAZMAT	2	-	-	-	-	-
Helicopter Pad/Staging	6	-	1	-	-	-
Incident Command Post	3	-	-	-	-	2
Medical Facility	3	-	1	-	-	-
Police	1	1	2	1	1	1
School	10	-	8	2	2	2
Substations	2	-	1	-	1	-
Water/Wastewater	7	1	1	1	1	2
Totals	**129**	**5**	**31**	**10**	**15**	**23**

Source: Summit County GIS Department

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

Natural, Historic, and Cultural Assets

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.

One particular asset that falls into all three categories 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 disaster-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.

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 wetlands 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 are vital.

According to the Wetlands FAQ on the Summit County website, 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). 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 (i.e., endangered 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 plants and animals that have been proposed as endangered or threatened but are not currently listed.

According to the U.S. Fish and Wildlife Service, as of April 2013, there were 13 federal endangered, threatened, or candidate species in Summit County. These species are listed in Table 3.18 along with state listed species. State special concern is not a statutory category, but suggests a species may be in danger.

Table 3.18. Select List of Rare Species Found in Summit County

Common Name	Scientific Name	Type of Species	Status
Bald eagle	*Haliaeetus Leucocephalus*	Bird	State Threatened
Bonytail chub*	*Gila elegans*	Fish	Federal Endangered
Boreal toad	*Bufo boreas*	Amphibian	State Endangered
Canada lynx	*Lynx canadensis*	Mammal	Federal Threatened
Colorado pikeminnow*	*Ptychocheilus lucius*	Fish	Federal Endangered
Greenback Cutthroat trout	*Oncorhynchus clarki ssp. Stomias*	Fish	Federal Threatened
Humpback chub*	*Gila cypha*	Fish	Federal Endangered
Mexican spotted owl	*Strix occidentalis lucida*	Bird	Federal Threatened
North American wolverine	*Gulo gulo luscus*	Mammal	Federal Threatened
Northern leopard frog	*Rana pipiens*	Amphibian	State Special Concern
Northern pocket gopher	*Thomomys talpoides*	Mammal	State Special Concern
Northern river otter	*Lutra Canadensis*	Mammal	State Threatened
Osterhout milkvetch	*Astragalus osterhoutii*	Plant	Federal Endangered
Penland alpine fen mustard	*Eutrema penlandii*	Plant	Federal Threatened
Plains sharp-tailed grouse	*Tympanuchus phasianellus jamesii*	Bird	State Endangered
Razorback sucker*	*Xyrauchen texanus*	Fish	Federal Endangered
Sage grouse	*Centrocercus urophasianus*	Bird	Federal Candidate
Southwestern willow flycatcher	*Empidonax traillii extimus*	Bird	State Endangered
Uncompahgre fritillary butterfly	*Boloria acrocnema*	Insect	Federal Endangered
Yellow-billed cuckoo	*Coccyzus americanus*	Bird	Federal Candidate

Source: Endangered, Threatened, Proposed and Candidate Species Colorado Counties (April 2013), U.S. Fish and Wildlife Service Mountain-Prairie Region, www.fws.gov/mountain-prairie/endspp/; Natural Diversity Information Source of the Colorado Division of Wildlife, http://ndis.nrel.colostate.edu/

* Water depletions in the Upper Colorado River and San Juan River Basins, may affect the species and/or critical habitat in downstream reaches in other states.

Note: State status information is from the NDIS, which does not track county occurrence of fish or insects at this time.

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 critically imperiled, imperiled, or imperiled/rare or uncommon. These communities are listed below.

- Alpine meadows
- Alpine wetlands
- Alpine willow scrub
- Clustered sedge wetland

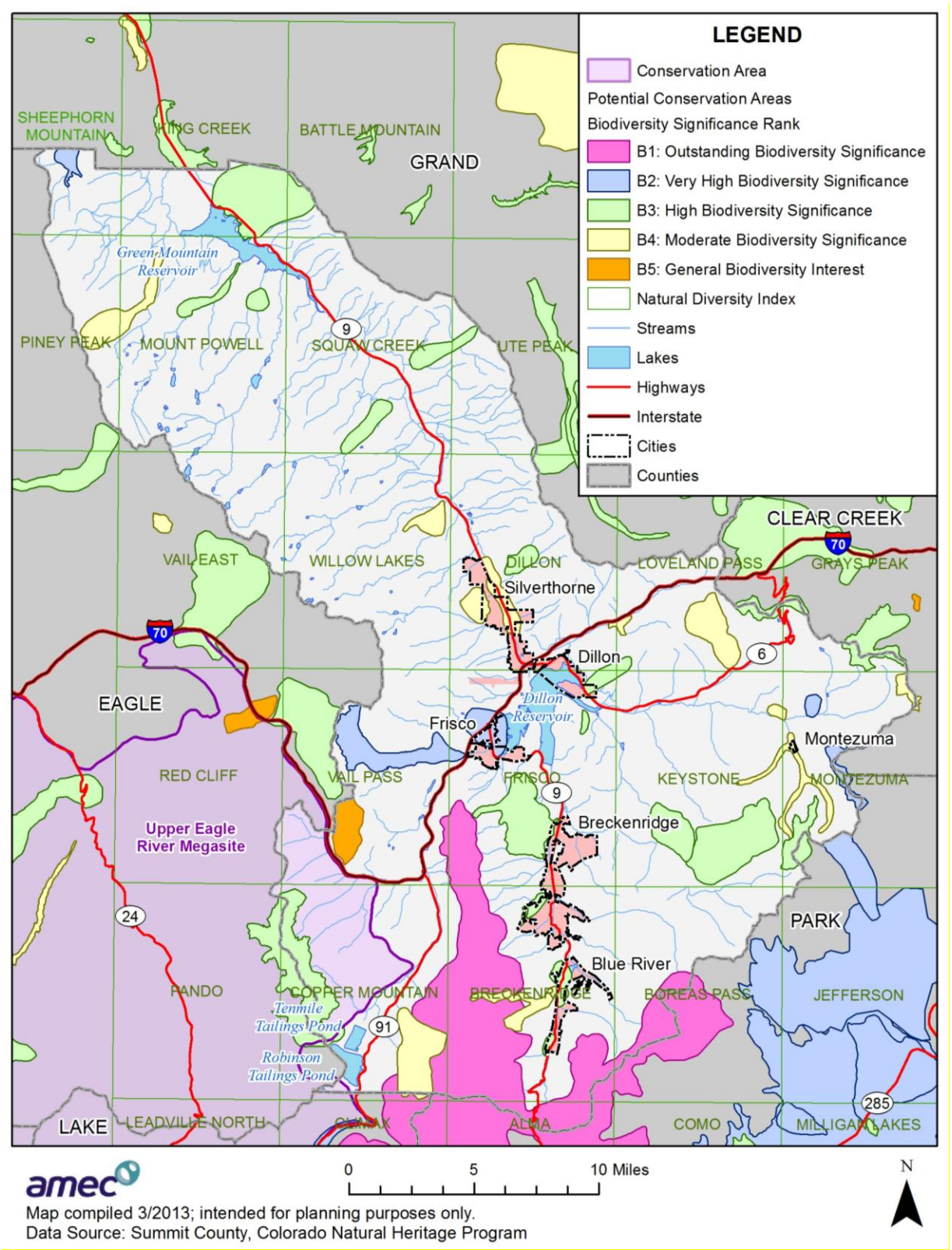
- Drummonds willow/mesic forb
- Geyer's willow/beaked sedge
- Geyer's willow – Rocky Mountain Willow/mesic forb
- Lower montane forests
- Lower montane woodlands
- Mesic alpine meadows
- Montane aspen forest
- Montane floating/submergent wetland
- Montane riparian forest
- Montane riparian shrubland
- 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 3.39 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 unsurveyed 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 3.39. Summit County Ecologically Sensitive Areas



Historical and Cultural Resources

Several national and state historic inventories were reviewed to identify historic and cultural assets in Summit County:

- The **National Register of Historic Places** is the Nation's official list of cultural resources worthy of preservation. The National Register 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, which is part of the U.S. Department of the Interior.
- The **Colorado State Register of Historic Properties** is a listing of 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.

Table 3.19 lists the properties and districts in Summit County that are on the Colorado State Register of Historic Properties. Those properties that are also on the National Register of Historic Places are indicated with an asterisk. In addition to these properties, several other structures have been designated by the County for their historic significance (e.g., the Rice Barns, Slate Creek Hall, and Old County Courthouse).

Table 3.19. Summit County Historic Properties/Districts in State and National Registers

Property Name	City	Location	Date Listed
Boreas Railroad Station Site*	Breckenridge	Boreas Pass Road, northwest of Como, Pike National Forest	10/28/1993
Breckenridge Historic District*	Breckenridge	Roughly bounded by Jefferson Avenue, Wellington Road, High, and Main Street	4/9/1980
Frisco Schoolhouse*	Frisco	120 Main Street	9/15/1983
Montezuma Schoolhouse*	Montezuma	5375 Webster Street	1/9/2007
Porcupine Peak Site* (prehistoric site)	Dillon	Address Restricted	8/1/1980
Slate Creek Bridge*	Slate Creek	County Road 1450, over Blue River	6/24/1985
Staley-Rouse House	Frisco	518 Main Street	5/31/2007
Wildhack's Grocery Store-Post Office*	Frisco	510 Main Street	5/16/1985

Sources: Directory of Colorado State Register Properties, www.coloradohistory-oahp.org/programareas/register/1503/; National Register Information System, www.nr.nps.gov/

*On both the Colorado State Register of Historic Properties and the National Register of Historic Places

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. 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. Structural mitigation projects are considered alterations for the purpose of this regulation.

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as, agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster. 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 disaster impacts to the economy. When major employers are unable to return to normal operations, impacts ripple throughout the community. Table 3.20 lists the top employers in Summit County by number of employees.

Table 3.20. Top Employers in Summit County

Name	Address	City
1,000+ Employees		
Breckenridge Ski Resort*	Summit County Road 3 # C	Breckenridge
Copper Mountain Resort*	Ten Mile Circle	Frisco
Keystone Lodge*	U.S. Highway 6	Keystone
Keystone Resort	U.S. Highway 6	Keystone
500-999 Employees		
Everist Materials Llc	Highway 9	Silverthorne
Keystone Resort	County Road 8	Keystone
100-499 Employees		
Arapahoe Basin Ski Area	U.S. Highway 6	Dillon
Beaver Run Resort & Conference	Village Road	Breckenridge
Breckenridge City Offices	Ski Hill Road # 3	Breckenridge
Breckenridge Lodging	S Park Avenue	Breckenridge
Breckenridge Medical Center	S Park Avenue	Breckenridge
Breckenridge Public Works	Airport Road	Breckenridge
Breckenridge Recreation Center	Airport Road	Breckenridge
City Market	N Park Avenue	Breckenridge
City Market	Dillon Ridge Road	Dillon
Colorado Mountain Express	Warren Avenue	Silverthorne
East West Resorts	S Main Street	Breckenridge
Great Divide Lodge	Village Road	Breckenridge
ResortQuest Breckenridge	S Main Street	Breckenridge
Summit County Government	N Park Avenue	Breckenridge
Silverthorne Town Hall	Center Circle	Silverthorne
St. Anthony Summit Medical Center	Peak One Drive	Frisco
Stan Miller Inc	Highway 9	Breckenridge
Summit High School	Highway 9	Frisco
Target	Blue River Parkway	Silverthorne
Village At Breckenridge	S Park Avenue	Breckenridge
Wal-Mart	N Summit Boulevard	Frisco
Wildernest Property Management	Wildernest Road	Silverthorne
Wildernest Real Estate	Wildernest Road	Silverthorne

Source: Colorado Department of Labor and Employment, http://lmigateway.coworkforce.com/
*Owned by Vail Resorts, Inc.

It is evident by the information presented in Table 3.20 that the County's largest employers are involved in the ski/tourism industry. A natural hazard, such as a drought or wildfire, could

severely impact the industry and the County's economy (including the large retailers that are also among the largest employers).

3.3.3 Vulnerability by Hazard

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 was limited to the hazards that were considered moderate or high in planning significance, based on HMPC input and the hazard profiles. Hazards ranked of low significance due to a lack of notable past damage or very low probabilities are not included in the vulnerability assessment. These include the following:

- Erosion and Deposition

Vulnerability for these hazards is discussed in qualitative terms in Section 3.2 Hazard Profiles. Although ranked of low planning significance, loss estimates for earthquake are included here because of the readily available HAZUS data from the State.

This assessment is also limited by the data available for the high or moderate ranked 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, mountain pine beetle infestation, 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

Summit County is highly vulnerable to avalanche-related injuries and fatalities due to the four major ski areas located in the County and the high recreational use of backcountry areas. Backcountry recreationalists, skiers, 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. Thus, there is a 96% chance that avalanche-related injuries or deaths will occur in any given year (25 casualties over 26 years). 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.

Existing Development

The County does not have any comprehensive information or mapping of avalanche hazard areas, so there is not data available to identify specific structures at risk or estimate potential losses to structures. The Colorado Avalanche Information Center has mapped zones on Loveland Pass. The HMPC identified the Ten Mile power transmission line as a potential vulnerable critical infrastructure, as well as 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.

Future Development

The Summit County Countywide Comprehensive Plan discourages building on slopes greater than 30 degrees, but there is no avalanche hazard identified or mapped. There are no guidelines related to utility lines in avalanche hazard areas.

Dam Failure

Although there is no specific evidence to indicate the likelihood of dam failure within the County, there are several high hazard dams located in Summit County. A dam failure could result in impacts greater than the 100-year flood event and could be catastrophic. Vulnerability to dam failure is highest in Silverthorne immediately downstream of Dillon Reservoir. A catastrophic dam failure would challenge local response capabilities and require timely evacuations below Dillon Dam to save lives. Impacts to life safety will depend on the warning time available and the resources to notify and evacuate the public. Major loss of life could result as well as potentially catastrophic effects to roads, bridges, and homes. Upper Blue Lake dam above the towns of Blue River and Breckenridge could also cause potential losses. Due to its remote location problems may not be detected as quickly when compared to the Dillon Dam.

Associated water quality and health concerns could also be an issue. The failure of the tailings dam in southwestern Summit County near Fremont Pass could release a toxic sludge debris flow. Denver Water has also enacted enhanced security measures for Dillon Dam.

Existing Development

The Summit County Office of Emergency Management has copies of emergency action plans for all high and significant hazard dams in the County; and these are available upon request for inspection by FEMA and the Colorado Division of 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 these areas could not be calculated. 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.

Future Development

Flooding due to a 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 five high hazard and two significant hazard dams. Low hazard dams could become significant or high hazard dams if development occurs below them. 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.

Drought

The majority of past disaster declarations are related to drought, which indicates the County's vulnerability to this hazard. Ongoing drought has 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 based upon the ski industry and other outdoor recreation and tourism, is vulnerable to drought conditions.

The 2010 Colorado Drought Plan's drought vulnerability study identifies Summit County as having moderate vulnerability to drought in the recreation sector. Summit, as well as Eagle, and Pitkin counties stand out with large ski resorts that are not ranked as being particularly vulnerable. This is attributed to the adaptive capacity linked to their size and that they all have snowmaking in their resorts. There is also an assumption that large resorts have invested in diverse activities to appeal to a range of visitors. However, 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 2010 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, 306). The study indicates that Summit County has a high vulnerability in the socioeconomic sector, largely due to the large lack of economic diversity and tourism economy base.

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.

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.

Earthquake

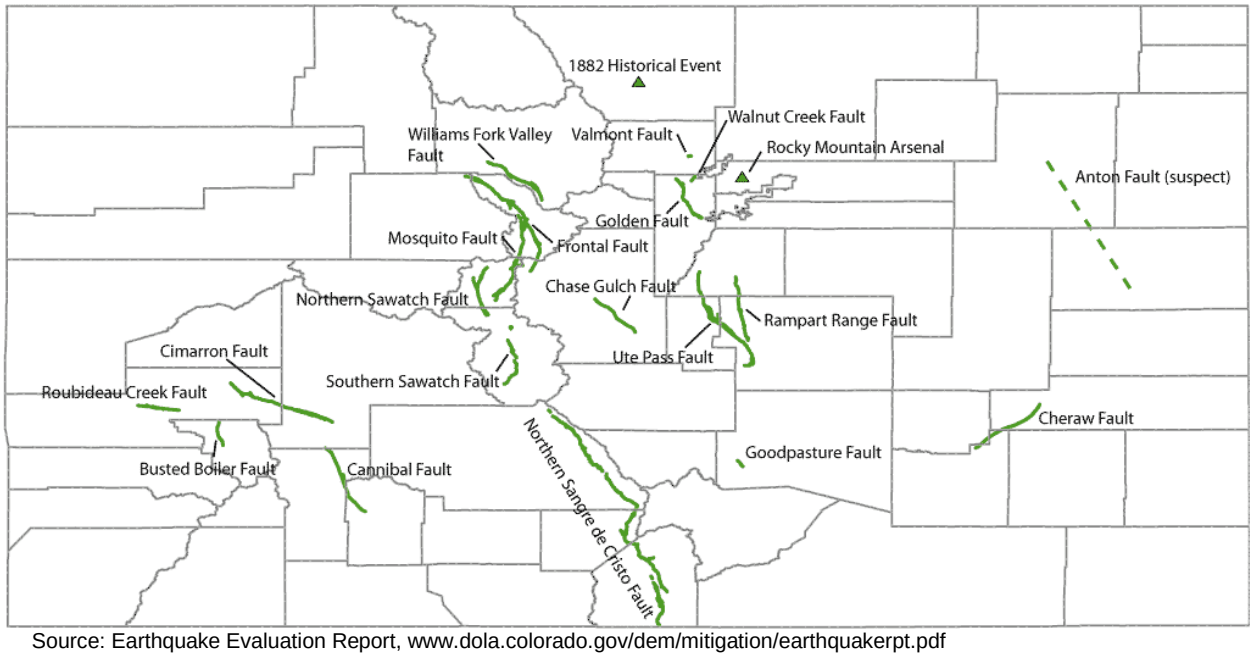
Past impacts due to earthquakes have been minimal and potential magnitude and severity is believed to be low, so the County's overall vulnerability to earthquake is low. However, data on Colorado's earthquake hazard is limited.

Existing Development

The Colorado Geological Survey (CGS) ran a series of deterministic scenarios for selected Colorado faults using HAZUS-MH to assess potential economic and social losses due to earthquake activity in Colorado. Deterministic analyses provide "what if" scenarios (e.g., determines what would happen if an earthquake of a certain magnitude occurred on a particular

fault). The earthquake magnitudes used for each fault were the "maximum credible earthquake" as determined by the U.S. Geological Survey. The faults analyzed for Summit County were Chase Gulch, Frontal, Golden, Mosquito, Northern Sangre de Cristo, Northern Sawatch, Southern Sawatch, Ute Pass, and Williams Fork (see Figure 3.40). Table 3.21 summarizes the results for Summit County.

Figure 3.40. Faults Analyzed for Potential Losses, Statewide



Source: Earthquake Evaluation Report, www.dola.colorado.gov/dem/mitigation/earthquakerpt.pdf

Table 3.21. Potential Earthquake Losses in Summit County by Fault

Fault/Magnitude	Fatalities	Total Economic Loss ($)*	Loss Ratio (%)**
Chase Gulch			
M6.75	0	8.5 million	0.2
Frontal			
M7.0	29	895 million	20.1
M6.5	6	348 million	7.8
M6.0	1	90 million	2.0
M5.5	0	25.5 million	0.6
Golden			
M6.5	0	2.4 million	0.05
Mosquito			
M7.0	18	660 million	14.9
M6.5	6	288 million	6.5
M6.0	0	77.2 million	1.7
M5.5	0	20.6 million	0.5
Northern Sangre de Cristo			
M7.5	0	2.5 million	0.05
Northern Sawatch			
M7.0	0	21 million	0.5
M6.5	0	8.6 million	0.2
Southern Sawatch			
M7.25	0	14 million	0.3
Ute Pass			

Fault/Magnitude	Fatalities	Total Economic Loss ($)*	Loss Ratio (%)**
M7.0	0	1.8 million	0.04
Williams Fork			
M6.75	3	186.4 million	4.2
M6.0	0	39.7 million	0.9
M5.5	0	13 million	0.3

Source: Earthquake Evaluation Report, www.dola.colorado.gov/dem/mitigation/earthquakerpt.pdf
*Direct and indirect losses
**Percentage of the total building stock value damaged; the higher this ratio, the more difficult it is to restore a community to viability (loss ratios 10% or greater are considered by FEMA to be critical)

The results of the statewide analysis place Summit County fourth among Colorado counties in regard to potential losses (high monetary loss, casualties, and loss ratios). The greatest losses would likely result from an M7.0 earthquake or greater on the Frontal or Mosquito faults, which are predicted to cause many fatalities and millions of dollars in damage.

Specific details about the earthquake potential in Summit County and Colorado in general remain largely unknown. A 2,500 year probabilistic HAZUS earthquake scenario was performed as part of this mitigation plan's 2013 update and the results can be referenced below in Table 3.22. This scenario takes into account worst case ground shaking from a variety of seismic sources. According to this probabilistic scenario, there is the potential for 6% of the total number of buildings in the County to be affected, roughly 943 buildings experiencing at least moderate damage. Total economic impacts could exceed $100 million, but casualty estimates are relatively small. Due to the low probability of a damaging earthquake occurring, as discussed below, the planning significance of earthquakes is considered low by the HMPC.

Table 3.22. HAZUS-MH Earthquake Loss Estimation 2,500-Year Scenario Results

Type of Impact	Impacts to County
Total Buildings Damaged	Slight: 1,979 Moderate: 814 Extensive: 123 Complete: 6
Building and Income Related Losses	$72 million 74% of damage related to residential structures 20% of loss due to business interruption
Total Economic Losses (includes building, income and lifeline losses)	$117.66 million
Casualties (based on 2 a.m. time of occurrence)	Not requiring hospitalization: 8 Requiring hospitalization: 1 Life threatening: 0 Fatalities: 0
Casualties (based on 2 p.m. time of occurrence)	Not requiring hospitalization: 10 Requiring hospitalization: 1 Life threatening: 0 Fatalities: 0
Casualties (based on 5 p.m. time of occurrence)	Not requiring hospitalization: 9 Requiring hospitalization: 1 Life threatening: 0 Fatalities: 0

Type of Impact	Impacts to County
Damage to Transportation and Utility Systems and Essential Facilities	No expected damage to utility pipeline systems No expected damage shown to essential facilities.
Displaced Households	32
Shelter Requirements	17

Source: AMEC and HAZUS-MH ver. 2.0: Global Summary Report

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 damage to infrastructure networks, such as water, power, communication, and transportation lines. Secondary impacts could include landslides or dam failure in a strong event.

Future Development

All jurisdictions within the County have adopted building codes. Building codes substantially reduce the potential for loss of life from earthquakes. Building codes can also help reduce the amount of damage to future structures. Continued growth of population in the County could potentially expose more people to earthquakes and their related hazards.

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 deaths and damaging property and infrastructure.

Existing Development

Potential losses to Summit County from flooding was analyzed by using a preliminary DFIRM with parcel data and building address point data provided by the Summit County Assessor's Office. Below is a discussion of the methodology, including limitations, assumptions, and observed trends of the methodology's results.

A refined flood vulnerability assessment was performed for the entire County using GIS during the 2013 update of this plan. This analysis replaces a previous Level 1 HAZUS flood analysis done in 2008. The parcel layer and associated assessor's building improvement valuation data were provided by the county and were used as the basis for the building inventory. Summit County's preliminary DFIRM was used as the hazard layer. DFIRM is FEMA's flood risk data that 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. The

"Shaded Zone X" represents the 0.2% annual chance hazard zone on the DFIRM. Summit County's preliminary DFIRM, dated February 2013, was determined to be the best available flood hazard data.

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, which assumes that improved parcels have a structure of some type. The DFIRM flood zones were overlaid in GIS on the parcel centroid data to identify structures that would likely be inundated during a 1% annual chance and 0.2% annual chance flood event. An effort was made to remove centroids from the analysis that may have been located within a flood zone, but the actual structure, based on imagery interpretation, was located outside of the flood hazard area. Building improvement values for the points were based on the assessor's data and summed for the unincorporated county and for the municipalities.

Results of the overlay analysis area shown in Table 3.23 and Table 3.24, and are summarized by the jurisdiction. More detail on the types of buildings impacted is provided in the jurisdictional annexes for Breckenridge, Frisco, Silverthorne, and the unincorporated County. Occupancy type refers to the land use of the parcel and includes residential, commercial, agricultural, industrial, government, mixed use, open space, backcountry, and other. Contents values were estimated as a percentage of building value based on their occupancy type, using FEMA/HAZUS guidance on estimated content replacement values. This includes 100% of the structure value for agricultural, commercial, and exempt structures, 50% for residential structures, 150% for industrial structures, and 0% for vacant land use classifications. Building and contents values were totaled, and a 25% loss factor was applied to the totals, also based on FEMA depth damage functions, assuming a 2 foot deep flood.

There are 311 improved parcels in the 1% annual chance flood zone. The total building exposure (actual building value plus content value estimate) in that flood zone is $690 million. Assuming a 2 foot deep flood, losses could be on the order of $172.5 million from the 1% annual chance flood event in Summit County. The countywide loss ratio (the ratio of the building value at risk divided by the overall county building value) is 1.01%.

Based on this analysis, the greatest losses in terms of the number of improved parcels impacted from a 1% annual chance flood would occur in unincorporated Summit County (roughly 142), followed by Frisco. Breckenridge would have the highest potential dollar losses. Countywide, losses could exceed $172 million. Dillon is not expected to suffer any losses from a 100-year flood. This loss estimate refines the previous plan's HAZUS loss estimate, which totaled $85 million.

Table 3.23. Summary of 1% Annual Chance Flood Building Exposure and Potential Loss by Jurisdiction

Jurisdiction	Improved Parcel Count	Improved Value	Estimated Content Value	Total Value	Loss Estimate	Loss Ratio
Blue River	-	-	-	-	-	-
Breckenridge	52	$227,825,969	$176,622,885	$404,448,854	$101,112,214	1.89%
Dillon	-	-	-	-	-	-
Frisco	69	$35,941,400	$24,093,733	$60,035,133	$15,008,783	0.92%
Montezuma	-	-	-	-	-	-
Silverthorne	48	$28,851,425	$18,996,741	$47,848,166	$11,962,042	1.02%
Unincorporated Areas	142	$111,187,018	$66,391,220	$177,578,238	$44,394,559	0.57%
Total	**311**	**$403,805,812**	**$286,104,578**	**$689,910,390**	**$172,477,598**	**1.01%**

Table 3.24. Summary of 0.2% Annual Chance Flood Building Exposure and Potential Loss by Jurisdiction

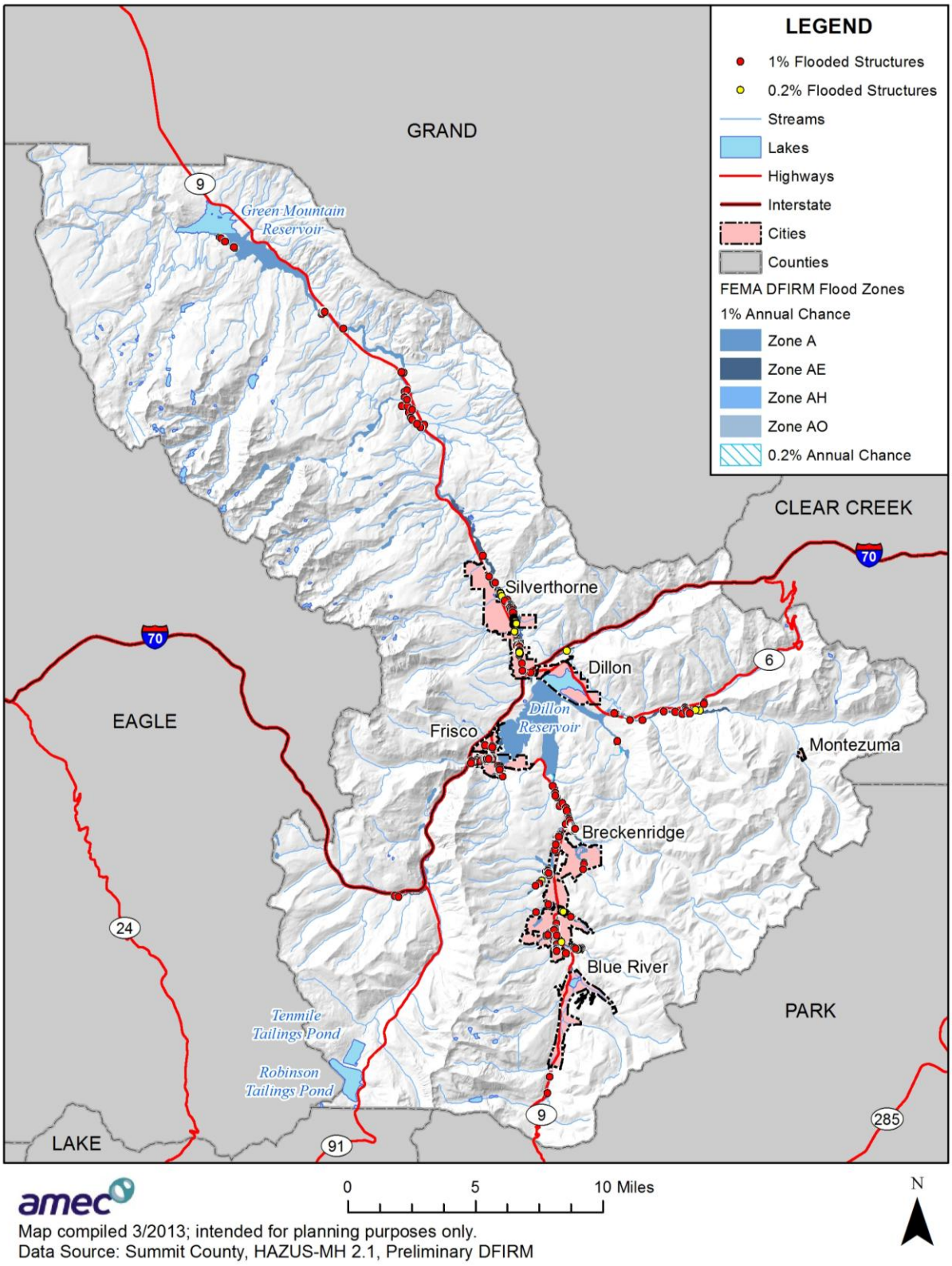
Jurisdiction	Improved Parcel Count	Improved Value	Estimated Content Value	Total Value	Loss Estimate	Loss Ratio
Blue River	-	-	-	-	-	-
Breckenridge	4	$1,831,278	$1,043,347	$2,874,625	$718,656	0.01%
Dillon	-	-	-	-	-	-
Frisco	5	$1,265,759	$632,880	$1,898,639	$474,660	0.03%
Montezuma	-	-	-	-	-	-
Silverthorne	6	$42,281,011	$42,281,011	$84,562,022	$21,140,506	1.80%
Unincorporated Areas	19	$36,713,556	$34,937,664	$71,651,220	$17,912,805	0.23%
Total	**34**	**$82,091,604**	**$78,894,901**	**$160,986,505**	**$40,246,626**	**0.24%**
Total 1% & 0.2% Zones	**345**	**$485,897,416**	**$364,999,479**	**$850,896,895**	**$212,724,224**	**1.25%**

An analysis on a structure footprint layer was performed to get another perspective of the actual count of structures (vs improved parcels) within the floodplain. The total structures by jurisdiction are shown in the following table. The analysis shows nearly 500 structures within the 1% annual chance floodplain. Figure 3.41 depicts the location of flooded properties in Summit County's 1% and 0.2% annual chance flood hazard area.

Table 3.25. Summary of Structures in the 1% Annual Chance Floodplain

Jurisdiction	Footprint Count
Blue River	-
Breckenridge	82
Dillon	-
Frisco	75
Montezuma	-
Silverthorne	81
Unincorporated Areas	261
Total	**499**

Figure 3.41. Summit County Preliminary DFIRM and Flood Prone Properties



There are 34 additional improved parcels in the 0.2% annual chance flood zone with a total building exposure (actual building value plus content value estimate) of $161 million. Table 3.24 shows the combined loss estimate from the 1% annual chance and the 0.2% annual chance flood events. The total building exposure in those 2 flood zones is $851 million. Assuming a 2 foot flood depth, there could be an estimated $40 million in losses from the 0.2% annual chance flood event. The countywide loss ratio for this flood event is 1.2%.

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 'reasonable'. 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. 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 mapped floodplains due to poor drainage, stormwater overflow, or in areas adjacent to streams that have not been mapped.

The population exposed to the flood hazard was estimated by applying an average household size factor (based on 2010 U.S, Census estimates for each jurisdiction) to the number of improved parcels identified in the flood hazard areas. Based on this estimate, a 1% annual chance flood would displace 1,212 people and a 0.2% flood would displace an additional 105 people. Table 3.26 summarizes the results of this analysis.

Table 3.26. Population at Risk to 1% and 0.2% Annual Chance Floods

Community	Average Household Size*	Parcel Count	Population at Risk
1% Annual Chance Flood			
Blue River	2.53	1	3
Breckenridge	2.28	86	196
Frisco	2.07	81	168
Silverthorne	2.68	77	206
Unincorporated Areas	2.36	271	640
Total		**516**	**1,212**
0.2% Annual Chance Flood			
Breckenridge	2.28	5	11
Frisco	2.07	5	10
Silverthorne	2.68	8	21
Unincorporated Areas	2.36	26	61
Total		**44**	**105**
Grand Total		**560**	**1,317**

*Based on 2010 US Census, factfinder2.census.gov

An analysis was done to identify critical facilities within the 1% annual chance DFIRM floodplain. Critical facilities data was obtained from the Summit County GIS Department. This analysis with the DFIRM only indicated one facility located within the 1% annual chance flood

zone, a USFS Dillon Ranger District office located in Silverthorne. According to the HMPC the office is not in the 1% zone due to a 2013 Letter of Map Revision. The JSA Waste Water Treatment Plant located in Silverthorne is located in the 0.2% annual chance flood zone. This analysis is an improvement from the HAZUS based analysis done in 2008, which indicated nine facilities in the 1% annual chance floodplain.

National Flood Insurance Program Policies Analysis

Table 3.27 provides detailed information on National Flood Insurance Program (NFIP) policies in participating jurisdictions in Summit County.

Table 3.27. 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	-	2011 (does not participate)	-	-	-	-	-
Breckenridge	06/04/1980	2011	46	$10,834,600	2	$28,060	N/A
Dillon	-	No SFHA identified	-	-	-	-	-
Frisco	05/15/1980	2011	151	$34,595,000	6	$921	8
Montezuma	-	No SFHA identified	-	-	-	-	-
Silverthorne	05/01/1980	2011	84	$21,677,900	1	$0	9
Summit County*	12/16/1980	2011	177	$37,884,800	15	$14,817	N/A

Source: National Flood Insurance Program
*Unincorporated areas

NFIP insurance data indicates that as of March 25, 2013, there were 177 flood insurance policies in force in the County (unincorporated areas) with $37,884,800 of coverage. Flood insurance coverage has increased from 147 policies when this plan was developed in 2008.

There have been 15 historical claims for flood losses totaling $14,817.

There were no repetitive losses in Summit County at the time of this plan's development. More detailed information for each jurisdiction can be found in the annexes.

Future Development

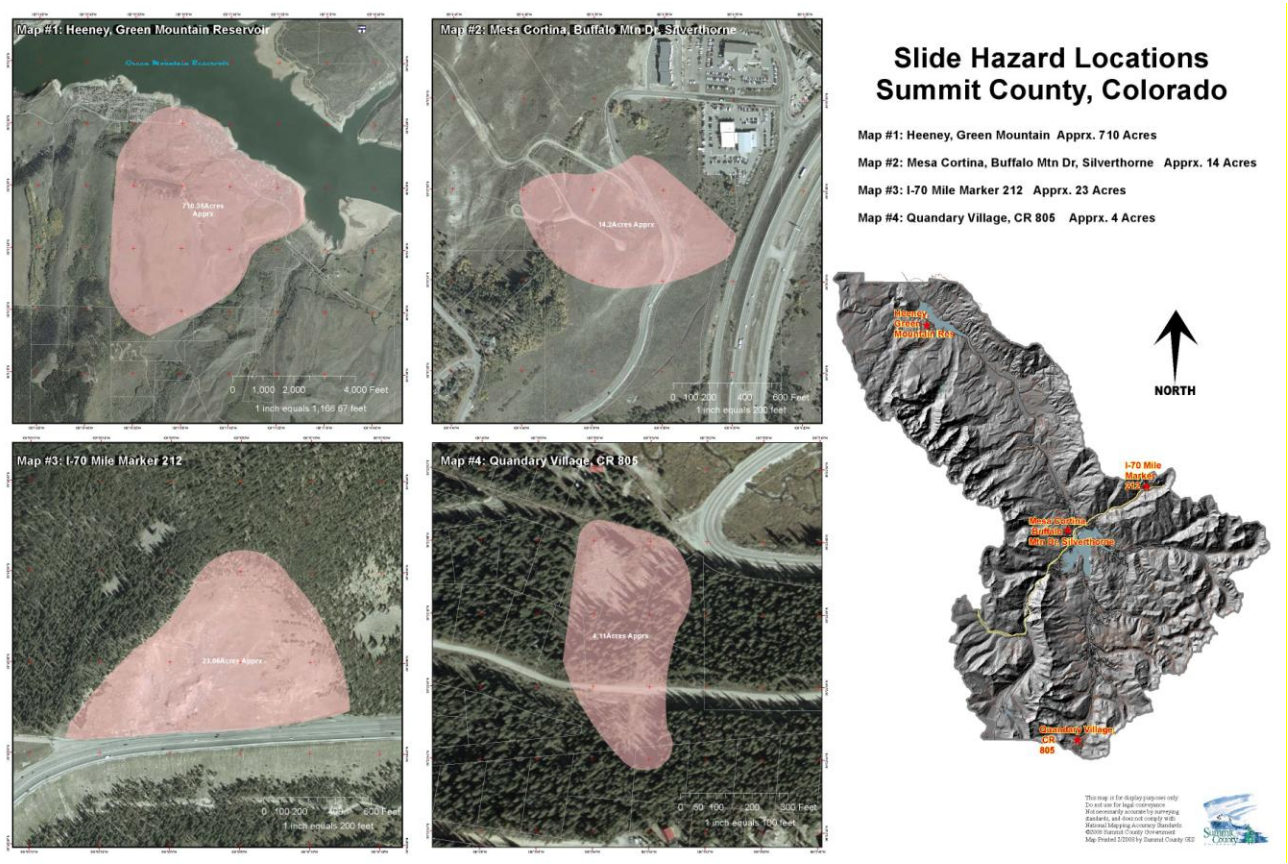
The risk of flooding to future development should be minimized by the floodplain management programs of the County and its municipalities, if properly enforced. Risk could be further reduced by strengthening floodplain ordinances and floodplain management programs beyond minimum NFIP requirements. Existing flood protection measures for the Blue River basin should be maintained to protect future development. Some of the reservoirs in the planning area provide only incidental flood protection, but projects such as the recent changes to the Blue

River Middle Branch channel can help reduce flood potential in developed areas. See Section 3.2.6 Flood for more details on flood hazards and flood protection measures in Summit County.

Landslide, Mudflow/Debris Fall, Rock Fall

In Summit County, vulnerability to landslides primarily occurs along roadways, where the hazard could cause deaths or injuries. Landslides and related hazards 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. An example is the area on Interstate 70 near mile marker 212 illustrated in Figure 3.42. Landslides in neighboring counties along major highways that carry traffic into Summit County also impact the County. Structures and people in them are also at risk to landslide in Summit County. The primary areas vulnerable to known active landslides are shown in Figure 3.42.

Figure 3.42. Landslide Hazards in Summit County



Source: Summit County

Existing Development

Potential losses for these four landslide areas were estimated using Summit County GIS and assessor's data and were examined in terms of values and critical facilities at risk. GIS was used to create a centroid, or point, representing the center of each parcel polygon, which was overlayed on the landslide hazard polygons. The assessor's land and 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 polygon, that parcel is assumed to be at risk to the landslide. Values were summed and sorted by landslide hazard zone. Additional landslide hazard analysis was completed using the more comprehensive USGS landslide deposits layer during the 2013 update. The results of the overlay analysis are presented in Table 3.28, and more detailed tables with the property types are provided in the jurisdictional annexes. While the results indicate a substantial amount of exposure to the hazard (particularly in Silverthorne), a more detailed, site-specific analysis would need to be conducted to further assess potential risk. In many cases landslide issues may have been mitigated during construction.

Table 3.28. Building Exposure to Landslide by Jurisdiction

Community	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Structure Value*
Blue River	3	1	$247,069	$256,639	$128,320	$384,959
Breckenridge	7	4	$1,297,960	$3,971,600	$1,985,800	$5,957,400
Dillon	-	-	-	-	-	-
Frisco	4	2	$2,164,100	$24,499,008	$12,302,176	$36,801,184
Montezuma	-	-	-	-	-	-
Silverthorne	165	100	$40,501,382	$68,828,514	$35,068,239	$103,896,753
Unincorporated Areas	711	488	$115,207,287	$138,703,489	$79,614,501	$218,317,990
Total	**890**	**595**	**$159,417,798**	**$236,259,250**	**$129,099,035**	**$365,358,285**

Source: Summit GIS and Assessor's Office (parcel data)
*Value represents "improved structure value" and includes contents. Does not include land value.

During the initial development of this plan the landslide problem areas of I-70 Mile Marker 212, Heeney, Mesa Cortina, and Quandary Village were analyzed specifically. Based on this analysis, the landslide hazard at Heeney poses the largest threat to Summit County. That landslide polygon intersects 91 parcels (88 residential, 2 government and 1 other development type) that have a total property value of $13 million ($4.9 million in land value and $8.2 million in improved value). The Quandary Village landslide hazard intersects 6 parcels (3 residential and 3 open space) that have a total land value of $109,550 (but no improved value). The Mesa Cortina landslide area intersects with 11 government parcels with no assets improved or land values.

There are 14 critical facilities located in potential landslide hazard areas. The facilities are summarized in Table 3.29. A more detailed, site-specific analysis would need to be conducted to further assess potential risk.

Table 3.29. Critical Facilities in Landslide Hazard Areas

Type	Name	Facility Count
Bridge	I 70 ML WBND	1
Bridge	I 70 ML EBND	2
Bridge	SH 9 ML	2
Bridge	US 6 ML	1
Dams	BLACK CREEK	1
Dams	HOAGLAND #1	1
Fire Facility	Lower Blue Station 15	1
Fire Lookout	Arapahoe Basin	1
Fire Lookout	Ptarmigan	1
Fire Lookout	A Rd and 2020	1
Fire Lookout	TYL Ranch	1
Incident Command Post	Green Mtn Dam	1
TOTAL		**14**

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.

Landslide hazard areas are not well mapped in Summit County. 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. 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.

Lightning

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. 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.

Lightning can occur anywhere in Summit County, and it is not possible to identify specific hazard area. Data was not available to identify specific structures at risk. Data on average annual losses was limited, but based on NCDC records $20,000 in lightning-related damages occurred between 1997 and 2012. One death and six injuries also resulted from lightning during that time span. Therefore, Summit County could expect roughly $1,333 dollars in damages from lightning in any given year. Casualties may occur approximately every 2.1 years. 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.

Mountain Pine Beetle Infestation

It is somewhat difficult to evaluate the vulnerability of existing and future development to Mountain Pine Beetle infestation. Although the Mountain Pine Beetle is unlikely to cause deaths or injuries or significant damage to property and infrastructures, it is killing millions of trees each year. The forest mortality resulting from this 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.

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 Ohio in 2003 caused the largest electrical outage in United States history, directly impacting an estimated 50 million people and causing billions of dollars in economic losses. In 2010 a multi-forest environmental assessment paved the way to allow for clearance of hazardous trees around power lines, but the implementation schedules rest with the individual utility operators.

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 the MPB epidemic will greatly increase the amount of dead biomass in lodgepole forests, but predictions that this translates into an immediately drastic increase in the fire hazard is an oversimplification. The cycle is nuanced and complex, and a variety of fuel profiles and fire concerns will emerge. Predicted changes in fuel loads and fire behavior are discussed in more detail in the following section on Probability of Future Occurrence.

Severe Winter Weather

Existing Development

In the alpine environment of Summit County, severe winter weather occurs several times every season. This hazard has been critical in its magnitude and severity in the past, most recently during the event in December 2007. 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. 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. 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.

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. NCDC data did not provide enough details on past damages and casualties to perform an average annual loss assessment.

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.

Wildfire

Vulnerabilities to wildfire include:

- Structures and private property
- Critical Infrastructure such as power lines and roadways
- Key Resources such as medical facilities, schools, watersheds, reservoirs, and public 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. Homes are lost, businesses are destroyed, community infrastructure is damaged, and, most tragically, lives may be lost.

Figure 3.43. Homes Intermixed in Summit County's Extensive WUI

Existing Development

Potential losses to wildfire were estimated using a countywide wildfire risk GIS layer (created for the Summit County Community Wildfire Protection Plan) and assessor's data from Summit County. Potential losses were examined in terms of acreage, property value, and critical facilities at risk. For all analyses, the threat levels were classified as low, medium, high, and extreme and were based on fuel hazards, risk of wildfire occurrence, essential infrastructure at risk, community values at risk, and local preparedness and firefighting capability.

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. Values were summed by wildfire threat zone and then sorted by town and fire protection district. The results are shown in Table 3.30. Additional detail on property types at risk are provided in the respective jurisdictional annexes, as well as more detailed wildfire hazard maps.

Data Limitation: The original parcel layer had 22,129 records and the original assessor's database had 35,638 records. Using Microsoft Access, records with duplicate PPIs (the unique

ID that is the common link between the assessor data and the parcel data) were pulled out and their values were summed. The parcels were converted into centroids (points) and dissolved or merged using GIS based on their PPI to account for duplicate parcels. This enabled the assessor data to be joined to the parcel database so that each record in the database had a unique instead of a many to many relationship. There were 290 records in the assessor's database that did not have corresponding PPIs in the parcel layer representing a total land value of $32 million and total improved value of $24 million). There were 206 parcels in the parcel layer that did not have corresponding PPIs in the assessor's database. So, a total of 496 records did not link between the two databases. This might be due to a difference in the timing between the data releases (e.g., there may have been annexes and changes to the parcel layer that had not been accounted for in the assessor's data). It was also observed that 169 of the 206 parcels that did not join with the assessor data were Right of Way parcels. The final dataset used for this analysis had 19,662 records, with 14,467 having improvements. The data contains a total land value of $3.9 billion, a total improved value of $10.6 billion, and a total combined value of $14.5 billion.

Table 3.30. Property Values in Wildfire Threat Zones by Jurisdiction

Jurisdiction/ Threat Zone	Total Parcel Count	Land Value ($)	Improved Value ($)	Total Value ($)
Blue River				
Extreme	-	-	-	-
High	11	$2,029,298	$2,761,584	$4,790,882
Medium	633	$127,091,076	$203,891,916	$330,982,992
Low	251	$43,191,315	$65,519,784	$108,711,099
Total	**895**	**$172,311,689**	**$272,173,284**	**$444,484,973**
Breckenridge				
Extreme	3	$455,228	$491,875	$947,103
High	90	$22,777,669	$91,103,107	$113,880,776
Medium	3,101	$967,497,238	$3,114,637,760	$4,082,134,998
Low	340	$120,984,647	$184,786,572	$305,771,219
Total	**3,534**	**$1,111,714,782**	**$3,391,019,314**	**$4,502,734,096**
Dillon				
Extreme	-	-	-	-
High	7	$1,203,289	$1,810,261	$3,013,550
Medium	426	$86,269,202	$394,245,401	$480,514,603
Low	140	$14,608,861	$34,020,803	$48,629,664
Total	**573**	**$102,081,352**	**$430,076,465**	**$532,157,817**
Frisco				
Extreme	2	$3,777,744	$395,330	$4,173,074
High	254	$75,312,399	$235,446,938	$310,759,337
Medium	1,553	$281,522,840	$809,723,779	$1,091,246,619
Low	3	$671,414	$999,484	$1,670,898
Total	**1,812**	**$361,284,397**	**$1,046,565,531**	**$1,407,849,928**
Montezuma				
Extreme	-	-	-	-
High	-	-	-	-
Medium	48	$4,930,932	$6,339,525	$11,270,457

Jurisdiction/ Threat Zone	Total Parcel Count	Land Value ($)	Improved Value ($)	Total Value ($)
Low	37	$3,348,059	$2,826,603	$6,174,662
Total	**85**	**$8,278,991**	**$9,166,128**	**$17,445,119**
Silverthorne				
Extreme	-	-	-	-
High	7	$3,570,723	$5,898,276	$9,468,999
Medium	951	$198,155,518	$369,057,236	$567,212,754
Low	1,158	$205,816,975	$377,302,757	$583,119,732
Total	**2,116**	**$407,543,216**	**$752,258,269**	**$1,159,801,485**
Unincorporated Summit County				
Extreme	132	$23,782,836	$49,424,544	$73,207,380
High	4,093	$767,451,335	$1,585,768,699	$2,353,220,034
Medium	5,266	$850,655,964	$2,706,517,057	$3,557,173,021
Low	1,156	$90,013,293	$399,943,618	$489,956,911
Total	**10,647**	**$1,731,903,428**	**$4,741,653,918**	**$6,473,557,346**
Lake Dillon Fire Protection District				
Extreme	81	$18,036,993	$31,691,687	$49,728,680
High	2,320	$462,676,027	$1,237,599,591	$1,700,275,618
Medium	5,515	$966,377,394	$3,369,841,106	$4,336,218,500
Low	1,754	$246,758,313	$472,440,168	$719,198,481
Total	**9,670**	**$1,693,848,727**	**$5,111,572,552**	**$6,805,421,279**
Lower Blue Fire Protection District				
Extreme	-	-	-	-
High	90	$5,358,100	$10,510,545	$15,868,645
Medium	168	$9,182,550	$24,882,623	$34,065,173
Low	150	$5,288,269	$14,905,060	$20,193,329
Total	**408**	**$19,828,919**	**$50,298,228**	**$70,127,147**
Red White and Blue Fire Protection District				
Extreme	56	$9,978,815	$18,620,062	$28,598,877
High	1,973	$390,955,238	$659,458,637	$1,050,413,875
Medium	5,921	$1,435,060,310	$3,835,331,690	$5,270,392,000
Low	984	$207,065,898	$310,384,568	$517,450,466
Total	**8,934**	**$2,043,060,261**	**$4,823,794,957**	**$6,866,855,218**
Countywide				
Extreme	137	$28,015,808	$50,311,749	$78,327,557
High	4,462	$872,344,713	$1,922,788,865	$2,795,133,578
Medium	11,978	$2,516,122,770	$7,604,412,674	$10,120,535,444
Low	3,085	$478,634,564	$1,065,399,621	$1,544,034,185
County Totals	**19,662**	**$3,895,117,855**	**$10,642,912,909**	**$14,538,030,764**

Source: AMEC and Summit County

Based on this analysis, unincorporated Summit County has the highest total property value at risk to wildfire, with roughly $6 billion in medium to extreme wildfire threat zones. Breckenridge is the town most at risk to wildfire, with approximately $4.2 billion in medium to extreme wildfire threat zones. Frisco is second most at risk, with approximately $1.4 billion in medium to extreme wildfire threat zones.

Among the fire protection districts, the Red, White, and Blue Fire Protection District has the highest total property value at risk to wildfire, with nearly $50 million in the extreme wildfire threat zone alone (all of which is located in unincorporated areas). Total property values in medium to extreme wildfire threat zones in the District approximates $6.1 billion. While the total property values in the extreme wildfire threat zone in the Lake Dillon Fire Protection District are higher than the Red, White, and Blue's (approximately $28.6 million), the latter's total property values are higher in the three zones combined (medium, high, and extreme): $6.3 billion. The Lower Blue FPD does not have any values in the extreme wildfire threat zone. Overall, the County has $12.9 billion in property values in medium to extreme wildfire threat zones.

Figure 3.44. Critical Infrastructure and Key Resources Vulnerable to Wildfire such as Watersheds and Power Lines

Table 3.31 summarizes the number of people at risk to wildfire in extreme and high threat zones, broken out by jurisdiction. Unincorporated areas of the County have the most people at risk for both extreme and high wildfire threat zones. Frisco had the second highest number of people at risk in high threat zones at 180, and Breckenridge had the second highest number in extreme threat zones. A grand total of 8,106 people are at risk in extreme and high wildfire threat zones. The Town of Montezuma only has parcels in medium and low wildfire threat zones; therefore, it is not included in Table 3.31 or Table 3.32.

Table 3.31. Population at Risk in Extreme and High Wildfire Threat Zones by Jurisdiction

Community	Average Household Size*	Parcel Count	Population at Risk
Extreme Wildfire Threat			
Breckenridge	2.28	2	5
Frisco	2.07	1	2
Unincorporated Areas	2.36	84	198
Total		**87**	**205**
High Wildfire Threat			
Blue River	2.53	10	25

Community	Average Household Size*	Parcel Count	Population at Risk
Breckenridge	2.28	65	148
Dillon	1.99	6	12
Frisco	2.07	180	373
Silverthorne	2.68	3	8
Unincorporated Areas	2.36	3,108	7,335
Total		**3,372**	**7,901**
Grand Total		**3,459**	**8,106**

*Based on 2010 US Census, factfinder2.census.gov

Table 3.32 on the following page lists critical facilities identified in high or extreme wildfire threat areas. There are 25 critical facilities located in high wildfire threat areas; these are located in Dillon, Frisco, Silverthorne, and unincorporated areas of the County. There are 11 critical facilities in extreme wildfire threat areas, all of which are in unincorporated areas of the County.

Table 3.32. Critical Facilities in High or Extreme Wildfire Threat Areas by Jurisdiction

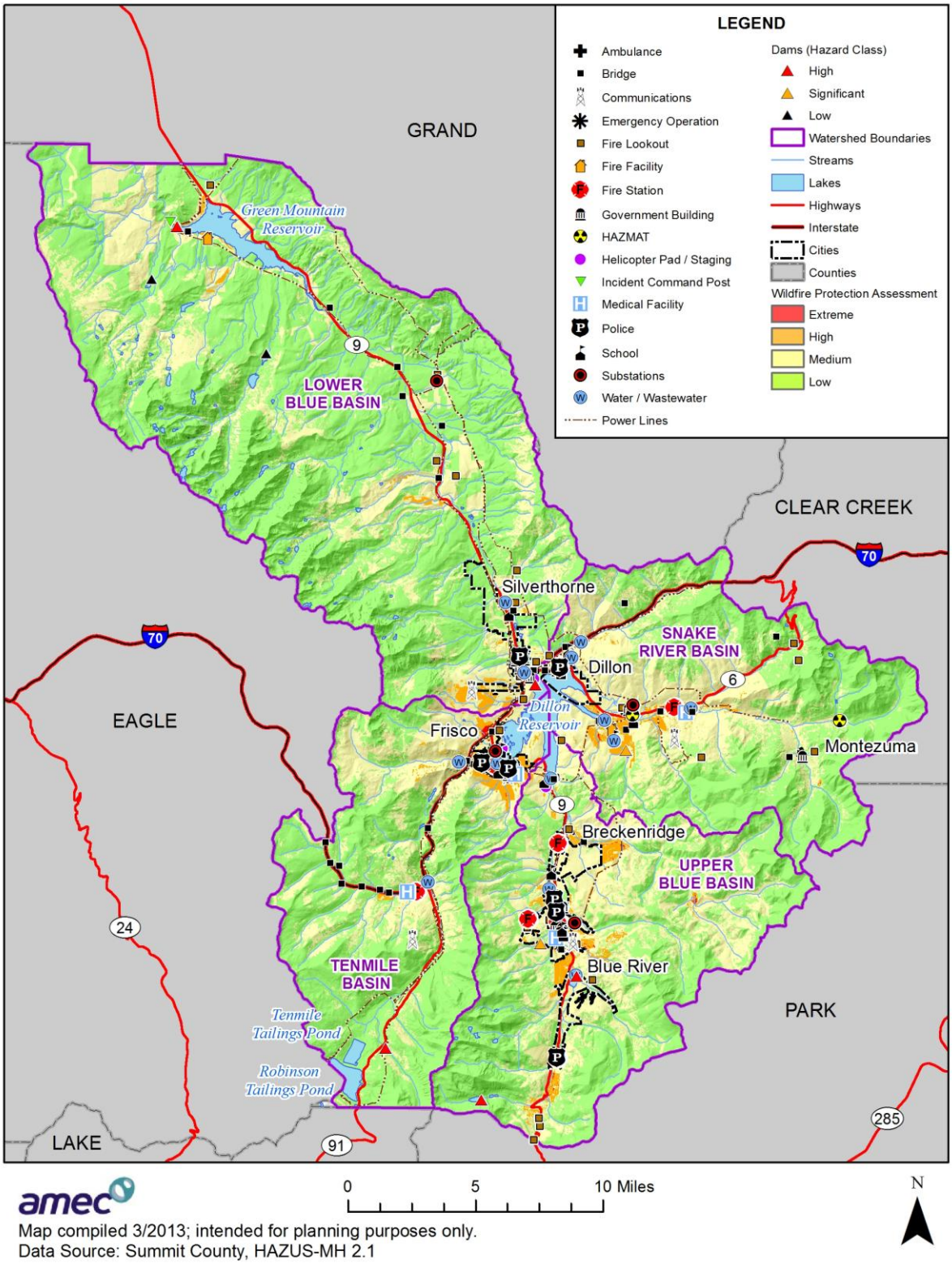
Jurisdiction	Facility Type	Facility Name	Facility Count
Extreme Wildfire Threat			
Unincorporated	Ambulance	County Bldgs EMS	1
	Communications	COMM Center	1
	EOC		1
	Fire Facility	High Country Training Center	1
	Government	Summit County Road & Bridge Shop	1
	Government	Summit Stage	1
	Government	Summit County Communications Center	1
	Government	CDOT Maintenance Building - Frisco	1
	Heli Pads	Hospital Helipad	1
	Incident Command Post	ES Building	1
	Medical Facility	St. Anthony's Summit Medical Center	1
	Total		**11**
High Wildfire Threat			
Dillon	Water / Wastewater	Dillon Treatment Plant	1
	Total		**1**
Frisco	Bridge		1
	Government	Frisco Public Works	1
	Police	Frisco Police Department	1
	Substations	39 School Rd	1
	Water / Wastewater	Frisco Waste Water Treatment Plant	1
	Total		**5**
Silverthorne	Water / Wastewater	Buffalo Mtn Waste Water Treatment	1
	Total		**1**
Unincorporated	Ambulance	Snake River Fire	1
	Bridge		4
	Communications	Wilderness Tower	1
	Fire Lookout	Passage Point	1
	Fire Lookout	A Rd and 2020	1
	Fire Station	Lake Dillon Fire Station 11	1

Jurisdiction	Facility Type	Facility Name	Facility Count
	Government	Summit County Road & Bridge Storage	1
	Government	Summit County Commons	1
	Government	Summit County Animal Control	1
	Government	Colorado State Patrol	1
	Government	Summit County Fleet Maintenance	1
	Government	Summit County Fueling Station	1
	Government	Summit County Community & Senior Center	1
	Government	Summit County Rescue Barn	1
	Police	Colorado State Patrol	1
	Total		**18**

Source: Summit County GIS Department

Figure 3.45 shows the locations of these facilities.

Figure 3.45. Wildfire Threat and Critical Facilities in Summit County



amec

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

Future Development

Summit County's population has more than tripled over the last 25 years. 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 Wildfire Protection Plan 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. Refer to the capability assessments in the jurisdictions' specific annexes for further details on these plans and regulations.

Figure 3.46. 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).

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. NCDC 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 Mountain Pine Beetle damage to trees (see discussion in that hazard's profile and vulnerability section). 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.

3.3.4 Development and Land Use Trends

As part of the planning process, the HMPC looked at changes in growth and development and 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.

Current Status and Past Development

According to the Summit County Planning Department, the 2010 estimated population of Summit County was 27,994. This is an increase of 18.9% from the 2000 U.S. Census population of 23,548. Based on this information, between 2000 and 2010, Summit County ranked 15th in percent of growth and 16th in numerical growth among Colorado's 64 counties, and, in 2010, Summit County was the 20th largest county in Colorado based on population. Note that the number of counties in Colorado increased from 63 to 64 between 2000 and 2010 due to the addition of Broomfield County. Table 3.33 through Table 3.36 illustrate past growth in Summit County in terms of population, housing units, and density.

Table 3.33. Summit County Population Growth 1970-2010

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

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

Table 3.34. Population Growth for Jurisdictions in Summit County, 2000-2010

Jurisdiction	2000	2010	Percent Change (%)	# Change	Percent of County (%)	Percent of Total Growth (%)
Blue River	685	849	+23.9	+164	3.0	3.7
Breckenridge	2,408	4,540	+88.5	+2,132	16.2	48.0
Dillon	802	904	+12.7	+102	3.2	2.3
Frisco	2,443	2,683	+9.8	+240	9.6	5.4
Montezuma	42	65	+54.8	+23	0.2	0.5
Silverthorne	3,196	3,887	+21.6	+691	13.9	15.5
Unincorporated Areas	13,972	15,066	+7.8	+1,094	53.8	24.6
Total County	**23,548**	**27,994**	**+18.9**	**+4,446**	**100.0**	**100.0**

Source: 2010 US Census, factfinder2.census.gov

Table 3.35. Growth in Housing Units for Jurisdictions in Summit County, 2000-2010

Jurisdiction	2000	2010	Percent Change (%)	# Change	Percent of County (%)	Percent of Total Growth (%)
Blue River	563	726	+29	+163	2.4	2.9
Breckenridge	4,270	6,911	+61.9	+2,641	23.2	46.8
Dillon	1,280	1,290	+0.8	+10	4.3	0.2
Frisco	2,727	3,117	+14.3	+390	10.4	6.9
Montezuma	35	55	+57.1	+20	0.2	0.4
Silverthorne	1,582	2,061	+30.3	+479	6.9	8.5
Unincorporated Areas	13,744	15,682	+14.1	+1,938	52.6	34.4
Total County	**24,201**	**29,842**	**+23.3**	**+5,641**	**100.0**	**100.0**

Source: 2010 US Census, factfinder2.census.gov

Table 3.36. Population and Housing Unit Density for Jurisdictions in Summit County, 2000-2010

Jurisdiction	Area in Square Miles	2000 Population Density	2010 Population Density	2000 Housing Density*	2010 Housing Unit Density
Blue River	2.2	314.22	385.91	258.26	330.00
Breckenridge	5.0	486.46	908.00	862.63	1,382.20
Dillon	1.5	524.18	602.67	836.60	860.00
Frisco	1.7	1,480.61	1,578.24	1,652.73	1,833.53
Montezuma	0.1	525.00	650.00	437.50	550.00
Silverthorne	3.2	1,008.20	1,214.69	499.05	644.06
Unincorporated Areas	594.6	23.50	25.34	23.11	26.37
Total County	**608.36**	**38.72**	**46.02**	**39.79**	**49.05**

Sources: U.S. Census Bureau, factfinder2.census.gov

According to the Countywide Comprehensive Plan, peak seasonal population may swell to nearly 160,000 people during peak periods (i.e., Christmas 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).

Current Status and Past Development Summary

- 15,066 individuals, or 53.8% of Summit County's residents, live in unincorporated portions of the County.
- Population growth, in terms of percent change, between 2000 and 2010 was greatest in Breckenridge (88.5%) and Montezuma (54.8%).
- Population growth numbers between 2000 and 2010 were greatest in Breckenridge, the unincorporated areas, and Silverthorne.
- All areas of the County experienced growth, but Frisco (9.8%) and unincorporated portions of the County (7.8%) experienced the least.

- Growth in housing units tracked relatively closely with the population growth.
- Between a quarter and a third of the total countywide population and housing unit growth occurred in unincorporated areas.
- With 1,578.24 people per square mile, Frisco has the highest population density in the County followed by Silverthorne (1,214.69).
- With 1,833.53 housing units per square mile, Frisco also has the highest housing unit density in the County followed by Breckenridge (1,382.20).

Land Use

In Summit County in 2009, about 70% of the zoned land was already built, which left approximately 30% still to be built. A significant amount of additional growth pressures could reasonably be anticipated in the coming years. An analysis of growth rates from 2003-2008 reveals that, on average, the number of residential housing units built in the County has increased approximately 1.4% per year, with an average of 380 new housing units constructed each year. At the same rate of growth, there would be approximately 32,594 units by 2020 and 36,394 units by 2030. These represent respective build-out percentages of 87% in 2020 and 97% in 2030. It is difficult to project when realistic build-out in the County will be achieved (as invariably it is influenced by a wide range of factors). In the last several years, development activity throughout the County has slowed down. This slowdown has been largely tied to an overall nationwide economic slowdown. If these trends continue or overall the economy stays stagnant, the timeframe until realistic build-out is reached will be prolonged. However, even under a slower growth scenario, it is very likely that build-out will be reached within the next 20 years. With that said, 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 3.37 breaks down the County's residential build-out by basin.

Table 3.37. Summary of Residential Build-out Analysis of Properties in Summit County by Basin, January 2013

	Absolute Build-Out (%)[1]	Realistic Build-Out (%)[2]
Lower Blue Basin		
Unincorporated Area	55.52	72.25
Town of Silverthorne	59.30	62.35
Total	**56.79**	**68.44**
Snake River Basin		
Unincorporated Area	72.20	72.20
Town of Dillon	70.94	70.94
Town of Montezuma	58.02	58.02
Total	**71.87**	**71.87**
Ten Mile Basin		
Unincorporated Area	72.97	76.68
Town of Frisco	92.38	92.38
Total	**83.85**	**85.67**
Upper Blue Basin		
Unincorporated Areas	60.47	69.33
Town of Blue River	78.76	78.76
Town of Breckenridge	81.28	83.29
Total	**73.28**	**78.12**
Countywide Totals[3]		
Unincorporated Areas	64.79	72.07
Incorporated Areas	78.12	79.75
Total County[4]	**70.58**	**75.57**

Source: Summit County Planning Department, January 1, 2013, http://www.co.summit.co.us/DocumentCenter/View/179

[1]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.

[2]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.

[3]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 build-out for the remaining four towns in the County (Breckenridge, Frisco, Dillon, and Silverthorne) was obtained from the respective planning departments. The build-out numbers for the towns of Breckenridge, Frisco, Silverthorne, and Dillon may be underestimated, as they are not currently as up-to-date.

[4]Commercial build-out for the County has not been 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. Nevertheless, the County Planning Department is in the process of completing a commercial build-out analysis and, as of January 1, 2013, 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. The White River

National Forest, managed by the U.S. Forest Service occupies over 80% of the County's total land area, thus confining growth to the remaining 20% of non-federal land.

Future Development

As indicated in the previous section, Summit County has grown substantially over the last four decades. Although growth is projected to continue through 2030, the growth rates experienced during the 1970s, 80s, and 90s are not expected to continue. Table 3.38 shows the population projections for the County as a whole through 2030.

Table 3.38. Population Projections for Summit County, 2000-2030

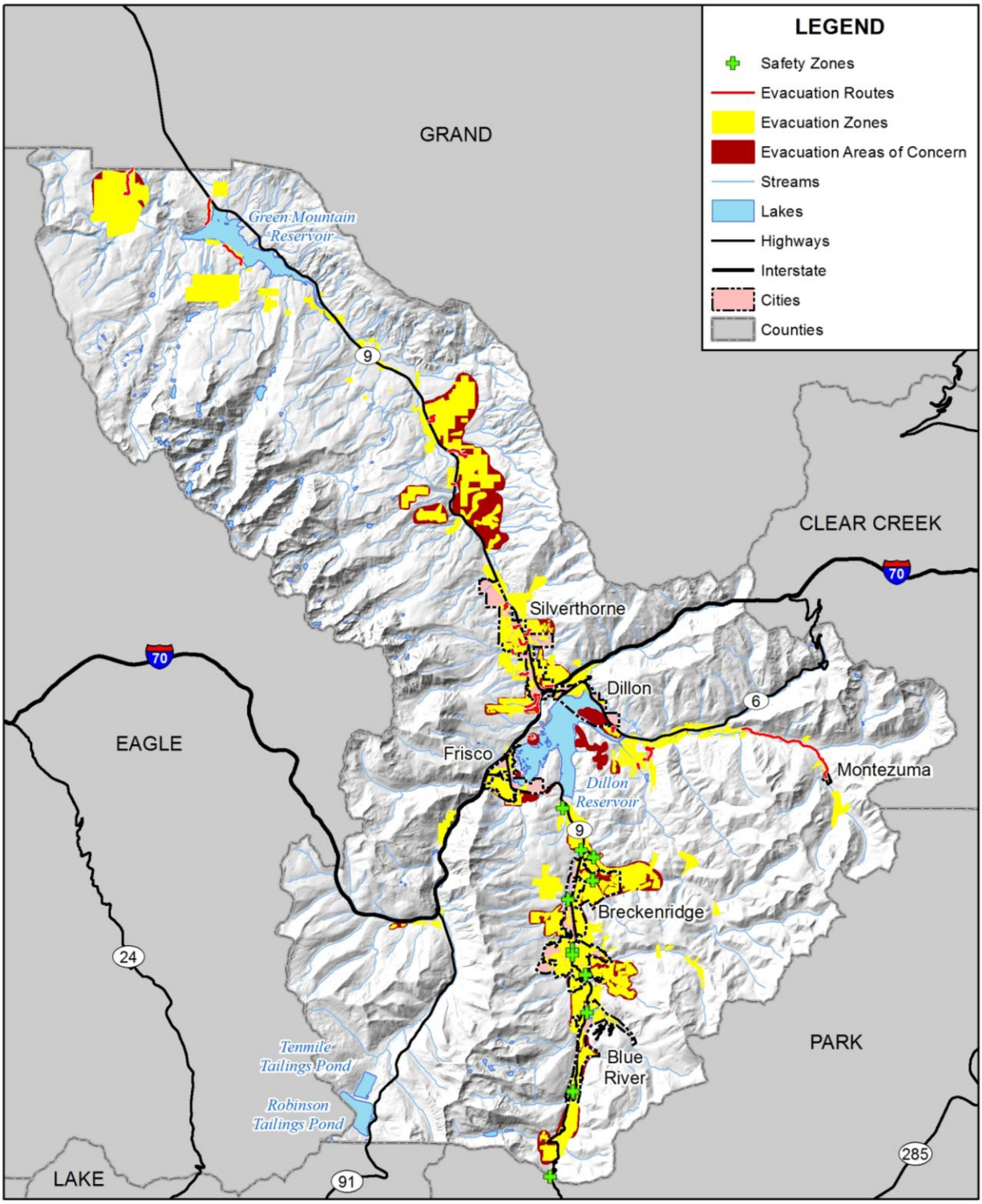
Time Frame/Years	Percent Change	New Residents Added	Projected Ending Population
2000-2015	13.2%	3,707	31,701
2015-2020	18.4%	5,842	37,543
2020-2025	15.0%	5,618	43,161
2025-2030	11.6%	5,026	48,187

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

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. 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 snow pack 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 Upper Blue Basin also has the most remaining development potential among the four basins, with an "absolute" build-out potential of approximately 15,250 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.

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 evacuation centers. The Summit County Office of Emergency Management has already coordinated evacuation planning for jurisdictions in the County. Figure 3.47 shows evacuation routes and identified areas of concern.

Figure 3.47. Summit County Evacuation Routes and Areas of Concern



amec

0 5 10 Miles

N

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County

3.4 Risk Assessment Summary

The Summit County Risk Assessment revealed a number of problem areas to be addressed in the mitigation strategy. These key findings are summarized in the following list.

Avalanche

- The most hazard-related deaths in Summit County are due to avalanches (58 between 1859-2006, according to *History of Colorado Avalanche Accidents, 1859–2006*)
- There were 23 avalanches involving deaths or injuries between 1987-2013
- In the past, avalanches have closed roads and highways and damaged power transmission lines

Dam Failure

- Five high hazard (probable loss of life if failure) dams are located in Summit County
- The largest water storage is in Dillon and Green Mountain reservoirs, where failures could result in catastrophic flooding
- Silverthorne is the area with the largest population at risk to a dam failure, but Blue River and Breckenridge also have potential population and property at risk.
- New development in dam inundation areas increases risk and may cause dam hazard rankings to change

Drought

- Multi-year droughts occur every 10 years on average in Summit County
- Drought can affect both water quantity and quality
- The tourism and recreation economy is particularly vulnerable to drought
- Drought increases risk to other hazards, such as erosion and deposition, mountain pine beetle infestation, and wildfire

Earthquake

- Roughly 943 buildings with at least moderate damage in 2,500-Year Probabilistic Scenario
- Total economic impacts could exceed $100 million
- Few casualty estimates

Erosion and Deposition

- Sanding along Interstate 70 and Highway 6 causes deposition problems and impacts water quality, particularly in Straight Creek and North Fork of the Snake River
- Drought has caused large dust problems near reservoirs

Flood

- The most people and property at risk to flooding are located in unincorporated areas of the County followed by Silverthorne, Breckenridge, and Frisco
- Most of the critical facilities identified in the 100-year floodplain have been mitigated or removed with recent DFIRM remapping.
- $104,992,300 in flood insurance in force (458 policies) in Summit County

Hazardous Materials Release

- There were 40 transportation-related hazardous materials incidents reported between 1990-2007 and 42 events reported between 2008 and 2012; these mainly related to gasoline and diesel fuel spills resulting from an accident
- 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

Landslide, Mudflow/Debris Flow, Rock Fall

- A landslide/rock fall hazard area includes all of Heeney and the adjacent developed shore area for about 1.5 miles; $8.2 million in improved property value is located in this hazard area
- A slump on Interstate 70 west of the Eisenhower tunnel could create significant impacts, such as closing the highway and affecting the watershed
- Quandary Village (approximately 4 acres) and Mesa Cortina in Silverthorne (approximately 14 acres) are other identified landslide hazard areas

Lightning

- Lightning-caused deaths and injuries 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

Mountain Pine Beetle Infestation

- The mountain pine beetle hazard is widespread and predicted to grow
- The infestation is likely to significantly affect forest ecosystems, the economy, and wildfire risk

Severe Winter Weather

- There is high vulnerability to severe winter weather along highways and mountain passes

- Increased population exposed to hazards and emergencies during high tourist seasons
- The severe winter weather hazard has been critical in magnitude and severity in the past, most recently in December 2007, when road closures caused the need for emergency sheltering of travelers

Wildfire

- 34.07% of Summit County acreage is at medium to extreme risk to wildfire
- Countywide there is an estimated $2.8 billion in property value in high wildfire risk areas; $78 million in extreme wildfire risk areas
- Critical roads, including Interstate 70, Highway 6, and Highway 9, are also vulnerable to wildfire
- 36 critical facilities are identified in high and extreme wildfire risk areas

Windstorm

- There is growing risk related to blowdown of dead trees which could impact recreational areas and powerline infrastructure

Multi-Hazard

- Past emergency declarations have been for drought and severe winter weather; state declaration for flood
- Hazard events that cause road closures, such as landslides, avalanches, and winter storms, affect the economy of Summit County by restricting access of visitors, workers, and goods and services
- Unique vulnerabilities of resort economy, particularly with drought and wildfire
- Need improved coordination between local governments and with state and federal agencies

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. The following definitions are based upon those found in FEMA publication 386-3, *Developing a Mitigation Plan* (2002):

- **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

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the hard work of the HMPC are captured in this mitigation strategy and mitigation action plan. As part of the 2013 plan update process, a comprehensive review and update of the mitigation strategy portion of the plan was conducted by the HMPC. Some of the initial goals and objectives from the 2008 plan were revisited, reaffirmed, and refined. The end result was an updated mitigation strategy that reflects the updated risk assessment, the completion of 2008 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, 2010, Summit County Countywide Comprehensive Plan, and Summit County Community Wildfire Protection Plan (2013). 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 2013 update. Committee members were given the list of goals from the 2008 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 minor edit in the third objective of Goal 3 to specify special districts. 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 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

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. The Town of Montezuma was not present at this meeting but communicated with the County and AMEC via email and individual meetings to identify mitigation actions for the Town. To identify and analyze potential mitigation actions to achieve the mitigation goals, AMEC 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 2008 and 2013 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 these. To facilitate the brainstorming process, the HMPC used a worksheet with the plan's previously identified goals and objectives. For each of the four goals, each HMPC member identified at least one mitigation action that would work toward achieving the goal. Each action was written on one index card, posted on the wall of the meeting room, and organized by the goal it represents.

Next, the HMPC re-sorted these index cards by the 10 priority hazards and a multi-hazard category. They discussed a list of potential mitigation alternatives for each of these hazards, which had been prepared by AMEC. This list is included in Appendix C. 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 mitigation actions for each hazard. New actions were written on index cards and added to those already on the wall organized by hazard. Certain hazards were best addressed through multi-hazard actions.

A similar process was repeated during the 2013 update at the third HMPC meeting to identify possible new action items. Although the County doesn't participate in CRS, the HMPC decided to categorize the mitigation actions in the 2013 plan update using the CRS mitigation categories. This allowed the HMPC to determine if mitigation projects were heavily focused on any particular category and give the County the opportunity to reevaluate project identification and priority.

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 2008, 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 index card on which the action was written. The number of dots next to each action was totaled.

These mitigation actions were also voted on using the same process by the attendees at the Natural Hazards Planning Open House that evening. The actions were listed on posters taped to the wall. Again, the dots for each mitigation action were totaled. Based upon the number of dots or votes they received at both meetings, the mitigation actions were assigned a priority of high, medium, or low.

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 Colorado Natural Hazards 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 2008 and 2013 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 2008 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 2013 update process the HMPC reviewed and evaluated the 2008 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. The 2008 mitigation strategy contained 51 separate mitigation actions. Of these actions, five have been deleted. The actions that have been deleted are shown in Table 4.1. In general, the review shows that much progress has been made since the original plan was adopted in 2008. 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 mountain pine beetle. Several of these actions have increased the mitigation and response capabilities of the County, and thus will help save lives in future incidents. Table 4.2 lists over 30 actions from the 2008 plan that have been implemented or are ongoing and being carried forward, 2 deferred actions, and 44 new mitigation actions. More detailed descriptions of those actions follow Table 4.2.

Summit County, in partnership with the Summit County Wildfire Council, has created a sustainable wildfire mitigation funding source and made great strides in its 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 lead 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, a total of 8,163 acres have been treated in the County since 2006.

Shortly after this plan was initially completed the County was able to successfully obtain a FEMA Pre-Disaster Mitigation 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.

Other mitigation actions have seen much progress and are close to completion. The status of the actions being carried forward from the 2008 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 2008 actions were revisited. Revised priorities are reflected in Table 4.2.

Table 4.1. Deleted Mitigation Actions from 2008 Plan

Jurisdiction	Action Description	Hazard(s)	Status	Comments/Progress
Multi-Jurisdictional—4	Complete a comprehensive inventory and vulnerability analysis of critical infrastructure and coordinate multi-jurisdictional continuity of operations/continuity of governance (COOP/COOG) planning	Multi-Hazard	Deleted	This action was poorly designed during the original planning process. The action will be resubmitted and focused on the update of the inventory or vulnerable and critical infrastructure.
Summit County—8	Identify and map geologic hazard zones and incorporate into master planning	Avalanche, Landslide, Mudflow/Debris Flow, Rock Fall	Deleted	The State Geological survey was planning to do a comprehensive geologic hazard mapping project that the County got grant funding for a few years ago. For unknown reasons the County did not accept the grant funding.
Summit County—12	Remove the North Fork River Estates lift station and replace it with a gravity sewer line system.	Flood	Deleted	Due to partial change in philosophy but mainly due to lack of agreement among several affected customers who don't want any changes or disruption on their properties.
Summit County—14	Consider joining the Community Rating System (CRS)	Flood	Deleted	County evaluated this but the administrative burden outweighed the potential benefits.

Jurisdiction	Action Description	Hazard(s)	Status	Comments/Progress
Silverthorne—3	Revise language of Silverthorne flood damage prevention ordinance to improve clarity and ease of use	Flood	Deleted/ completed	The Town of Silverthorne decided not to try to reinvent or re-explain FEMA's standard flood ordinance format and regulations. Staff is still available to assist citizens with questions. The flood ordinance was recently re-adopted via ordinance 1) to reflect FEMA DFIRM mapping effective dates, reflecting November 2011 effective dates, and 2) to incorporate new State mandated requirements, which are more stringent than the prior requirements, but plan to change the form and format of the standard regulation format.

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 will be 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 4.2 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 4.2. 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 4.2 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 4.2 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 4.2. 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	Ongoing	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	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.
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	Ongoing	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	Ongoing	Collaboration between the County and Towns on wildfire concerns is high. We recognize 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.

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Multi-Jurisdictional—6	Coordinate County emergency planning with Regulated Entities Emergency Planning and hazard vulnerability assessments (HVA)	Medium	Goal 2	Multi-Hazard PR	Ongoing	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.
Multi-Jurisdictional—7	Emergency operations plan exercise	Medium	Goal 1, 4	Multi-Hazard PR	New in 2013	Annual and ongoing
Summit County—1	Coordinate vulnerable populations plans	High	Goal 1	Multi-Hazard ES	Ongoing	The actions have resulted in the establishment of a Special Needs and Vulnerable Population Advisory Committee and now recently renamed the Functional and Access Needs Advisory Committee. The committee has active participation from partners who provide specialized services to clients. The Department of Social Services and Office of Emergency Management are active in the committee.

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Summit County—2	Support and participate in the Summit County Wildfire Council	High	Goal 1,4	Wildfire PR	Ongoing	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. 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. The CWPP lists a full table of implementation strategies for each focus area.
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	Ongoing	A strong link exists between the two plans. During this plan period the Wildfire Council funded the matching portion of a Pre-Disaster Mitigation Grant to put a defensible space project on the ground in the Keystone area.
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	Ongoing	The partnership with the Forest Health Task Force continues to be strong and productive. Homeowner series of classes are supported by speakers from the Wildfire Council and others. These meetings create an additional avenue of access to groups of people interested in conversations about hazards and mitigation activities.

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
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	Ongoing	This action results in the update of the CWPP mapping projects. Recently, a mapping project of defensible space work was completed and available to the public on our website. Additionally, the evacuation map book project was just updated in 2013.
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	This work was completed and is in a maintenance condition.
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 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	Ongoing	The Planning Department is continually updating the Development Code as needed. The Development Code naturally incorporates many of the Multi-Hazard Mitigation Plan principles.
Summit County—9	Develop protection plan for roadside ditches to reduce erosion and flooding	Medium	Goal 2	Erosion/ Deposition, Flood PR	Ongoing	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	Pending	Status pending

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
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	Ongoing	In addition the awareness to seasonal high water and potential flooding is discussed annually at a meeting with key stakeholders. During 2010 this resulted in the update of the high water material and establishment of sand bag caches as well as local sand pile distribution sites in the at risk communities.
Summit County---12	CWPP inclusion of water and utility focused layers	High	Goal 1	Wildfire PR	New in 2013	
Summit County---13	Prepare a hazard information and action guide	Medium	Goal 1	Multi-Hazard PI	New in 2013	
Summit County---14	Conduct public education and outreach programs	High	Goal 1	Multi-Hazard PI	New in 2013	
Summit County---15	Receive Storm Ready status from the National Weather Service	High	Goal 1	Multi-Hazard PR	New in 2013	
Summit County---16	Expand SCAlert Public Warning Groups	Medium	Goal 1	Multi-Hazard ES	New in 2013	
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	New in 2013	
Summit County---18	Wildfire property protection, structural retrofits, and non-combustible roof replacement program	High	Goal 1, 2	Wildfire PP	New in 2013	
Summit County---19	All-Hazards Warning System	Medium	Goal 1	Multi-Hazard PI, ES	New in 2013	
Blue River—1	Replace collapsing culverts and rebuild bridge over the Blue River on Blue River Road.	High	Goal 1, 2	Flood PR	Completed	Completed. The Town completed this project in 2009 by replacing two bridges. Funded 100% by the Town.

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Blue River-—2	Continue homeowner defensible space program begun in 2007	Medium	Goal 1	Wildfire PR	?	Ongoing. The Town is working with Red, White and Blue Fire Protection District on projects and has applied for Wildfire Council funding. The Town is enforcing their defensible space regulations and working with homeowners.
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	?	Ongoing. The project will be completed in September 2013 in partnership with Summit County.
Blue River—4	Augment water supply with new cisterns	High	Goal 1, 2	Wildfire PP	New in 2013	
Blue River—5	Develop comprehensive Master Plan	High	Goal 1	Multi-Hazard PI	New in 2013	
Blue River—6	Realign Spruce Creek Road with Colorado Highway 9	High	Goal 1	Multi-Hazard PR	New in 2013	
Breckenridge—1	Inspect metal culverts to determine risk of failure	High	Goal 1,2	Flood PR	Ongoing	Annual Inspection of all Culverts.
Breckenridge—2	Install erosion traps	High	Goal 1,2	Erosion/ Deposition, Flood PR	Ongoing	As Necessary, Sediment detention improvements.
Breckenridge—3	Promote defensible space and removal of beetle-infested trees	High	Goal 1,2	Wildfire PR	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 PI	Complete	Complete

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Breckenridge—5	Update and enhance evacuation plan	Low	Goal 1	Multi-Hazard ES	Complete	Complete
Breckenridge—6	Inventory and map locations of hazardous materials	Low	Goal 1	Hazardous Materials Release ES	Ongoing	Ongoing by fire department
Breckenridge—7	Locate portable wayfinding signage around Town during emergency events	Low	Goal 1	Multi-Hazard ES	Ongoing	Ongoing
Breckenridge—8	Emergency generator power connections at pump stations	Low	Goal 1, 2	Multi-Hazard ES	New in 2013	
Breckenridge—9	Watershed protection plan	High	Goal 1, 4	Multi-Hazard PR	New in 2013	
Dillon—1	Develop a Hazard Mitigation Planning Committee to guide policy and implementation	Low	Goal 4	Multi-Hazard PR	Ongoing	Ongoing. Committee composed of town department heads who meet regularly to discuss issues and develop mitigation policies. Group continues to look at issues concerning HAZMAT safety, dam security, wildfire awareness and preparation, water shed protection, drought planning and emergency planning.
Dillon—2	Improve education on risk and preparedness and mitigation measures	Low	Goal 1	Multi-Hazard PI	Ongoing	Ongoing. Outreach program initiated by use of pamphlets, public service announcements, and educational material in monthly water and sewer billings.
Frisco—1	Continue to implement Mountain Pine Beetle Plan to mitigate wildfire hazard	High	Goal 1,3	Mountain Pine Beetle, Wildfire PR	Ongoing	Mountain Pine Beetle has been addressed by the town over the last 5 or 6 years. The vast majority of pine beetle kill has been removed. The town has provided annual funding for removal as well as funding to plant new trees.

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Frisco—2	Improve information on website about natural hazard risk and mitigation	Low	Goal 1	Multi-Hazard PI	Ongoing	Information regarding flooding is made available to citizens every spring.
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.
Silverthorne—2	Continue to implement mountain pine beetle program and enforce ordinance	High	Goal 1,3	Mountain Pine Beetle, Wildfire PR	Completed/ ongoing	After changing the Town Code; the Town was surveyed for dead pine beetle trees in 2007, '08 and '09. During those years the ordinance was heavily enforced. Since 2010 there have been very few complaints regarding dead pine beetle trees. The Town has greatly reduced the fire hazard and brought the Town into compliance.
Silverthorne—3	Insure emergency power for wastewater treatment plant during extended power outage	Medium	Goal 2	Multi-Hazard PP	Completed/ ongoing	Backup generation is installed and operational as of 1999, additional automation and capacity are being evaluated.
Silverthorne—4	Insure continued water distribution during extended power outage	Medium	Goal 2	Multi-Hazard ES	Completed/ ongoing	The Town has completely automated backup power systems for all pressure zones. A portable Generator will be added in the next two years.
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	New in 2013	

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Silverthorne---7	Floodplain mapping and management	Medium	Goal 1	Flood PR	New in 2013	
Silverthorne—8	Community evacuation	High	Goal 1	Multi-Hazard ES	New in 2013	
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	
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	Completed	This Defensible Space Mitigation Action plan has been implemented. 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. Further, the District has incorporated a landscape maintenance requirement within the District Protective Covenants requiring all property owners to remove dead, dying, diseased, or insect-infested landscape materials as soon as possible after written notice by the Manager of such violation. The Protective Covenants include enforcement and penalty policy for non-compliance.

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
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	Completed	The Digital Data and Maps Mitigation Action has been implemented. In early 2010, the District established a digital Geographical Information System (GIS) identifying all assets within the District Boundary. The District is now able to electronically identify all water, sewer, road, and critical facilities at any given time.
Buffalo Mountain Metropolitan District—3	Obtain backup power for water pumping stations	Low	Goal 2	Multi-Hazard PP	Ongoing	The Backup Power for Critical Facilities Mitigation Action has not been implemented. The cost to purchase, install and maintain five back-up power generators has not been possible due to lack of funding. However, the District has identified five local companies that would rent back-up power generators to the District on an as needed basis.
Buffalo Mountain Metropolitan District—4	Source water protection plan	Medium	Goal 1, 4	Hazmat PR	New in 2013	
Buffalo Mountain Metropolitan District—5	Continue to implement mountain pine beetle program	High	Goal 1	Wildfire/Mountain Pine Beetle Infestation PR	New in 2013	
Buffalo Mountain Metropolitan District—6	Electronic communication with district constituents in cases of emergency (database of email address)	Medium	Goal 1	Multi-Hazard ES	New in 2013	
Buffalo Mountain Metropolitan District—7	Develop drainage improvement plan to reduce erosion and flooding to avert severe winter weather hazard	High	Goal 1	Multi-Hazard PR	New in 2013	

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Lake Dillon Fire Protection District—1	Maintain and enhance wildfire mitigation program	High	Goal 1,3	Wildfire PR	Deferred	This has not been implemented due to restructuring and re-assigning the management of the fire mitigation program responsibilities to the respective fire prevention divisions within the two fire districts and the Copper Mountain Consolidated Metropolitan District. To facilitate enforcement of the fire mitigation code amendment to the International Building Code, each district signed an intergovernmental agreement in 2010 with Summit County Government.
Lake Dillon Fire Protection District—2	Install emergency generators in three fire stations	Medium	Goal 1,2,3	Multi-Hazard PP	Ongoing	An external natural gas fuelled generator was installed in 2011 and is operational at Station 11 in Keystone. Budgeting for generators at Stations 2 (Frisco) and 8 (Dillon) are included in the five year capital plan contingent upon available funding.
Lake Dillon Fire Protection District—3	Rural addressing	High	Goal 1,	Wildfire ES	New in 2013	
Red, White, and Blue Fire Protection District—1	Create public education program encouraging wildfire defensible space	High	Goal 1	Wildfire PI	Completed/ ongoing	This action has been achieved as far as creating public education programs. We continue to enhance this action by utilizing the Firewise communities program to further grow the educational program.
Red, White, and Blue Fire Protection District—2	Promote household winter preparedness kits	High	Goal 1	Severe Winter Weather PI	Completed	This action has been achieved through our Ready, Set, Go program and focus not only on winter preparedness but all-hazard preparedness.

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	Deferred	This action has not been achieved. In 2012 RWB applied for grant funds through the Fire Act and was not awarded moneys for this project. This project has been identified in our long-range capital expenditures over the next 5 years.
Red, White, and Blue Fire Protection District—4	Conduct periodic community evacuation drills	Medium	Goal 1	Multi-Hazard ES	Ongoing	This action has been partially completed. In 2012 crew training placed our crews in one neighborhood for wildfire evacuation and planning training. The HOA participated in the evacuation piece, but this was limited to one HOA. We continue to work with our HOAs to provide evacuation drills to them during HOA talks. A full scale or larger area drill needs to still be conducted.
Red, White, and Blue Fire Protection District—5	Inventory and map locations of hazardous materials	Low	Goal 1	Hazardous Materials Release PR	Deferred	This has not been implemented. The research for building of this GIS layer has not fully been completed. A change in management took away from project focuses that are now being focused on again.
Red, White, and Blue Fire Protection District—6	Rural addressing	High	Goal 1	Wildfire ES	New in 2013	
Red, White, and Blue Fire Protection District—7	Firewise communities program	High	Goal 1, 4	Wildfire PI	New in 2013	
Copper Mountain Consolidated Metropolitan District—1	Wildland urban interface (WUI) fuels reduction program	High	Goal 1	Wildfire/ Mountain pine beetle kill PR	New in 2013	

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Copper Mountain Consolidated Metropolitan District—2	Enhanced public notification through cable network	High	Goal 1	Multi-Hazard PI	New in 2013	
Copper Mountain Consolidated Metropolitan District—3	Replace Copper Road West Tenmile culverts and Copper Circle West Tenmile culverts	High	Goal 1, 2	Flood PP	New in 2013	
Copper Mountain Consolidated Metropolitan District—4	Community wildfire protection planning	High	Goal 1, 4	Wildfire PR	New in 2013	
Dillon Valley District, East Dillon Water District, Mesa Cortina Water District, Snake River Water District -1	Backup power connection for treatment plants	High	Goal 1, 2	Multi-Hazard PP	New in 2013	
Dillon Valley District, East Dillon Water District, Mesa Cortina Water District, Snake River Water District -2	Trailer mounted generator	High	Goal 1, 2, 3	Multi-Hazard ES	New in 2013. In planning stages.	
Dillon Valley District, East Dillon Water District, Mesa Cortina Water District, Snake River Water District -3	Maintain existing wildfire mitigation efforts and identify access road mitigation needs	High	Goal 1, 2	Wildfire PR	New in 2013. In planning stages.	
Dillon Valley District, East Dillon Water District, Mesa Cortina Water District, Snake River Water District - 4	Develop Source Water Protection Plan (SWPP)	High	Goal 1, 3	Multi-Hazard NR	New in 2013	
Hamilton Creek Metro District- 1	Backup power for treatment plant	High	Goal 1, 2	Multi-Hazard PP	New in 2013	
Hamilton Creek Metro District - 2	Water supply interconnect	High	Goal 1, 2	Multi-Hazard ES	New in 2013	
Hamilton Creek Metro District - 3	Maintain existing wildfire mitigation efforts	High	Goal 1, 2	Wildfire PR	New in 2013	

Jurisdiction-Action Number	Action	Priority	Goals Addressed	Hazard and CRS category	Status	Comments
Hamilton Creek Metro District- 4	Continue education and outreach about water conservation	High	Goal 1	Multi-Hazard PI	Ongoing - electronic water meters installed in 2009	
Hamilton Creek Metro District - 5	Develop Source Water Protection Plan (SWPP)	High	Goal 1, 3	Multi-Hazard NR	New in 2013	
Denver Water—1	Update drought management plan	High	Goal 1	Drought PR	New in 2013	
Denver Water—2	Develop intergovernmental agreement with Summit County	Low	Goal 4	Wildfire PR	New in 2013	
Denver Water—3	AOP updated for property owners	Low	Goal 1	Wildfire PR	New in 2013	
Denver Water—4	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	New in 2013	
Denver Water—5	Develop GIS mapping coordination project to show damages based on dam EAPs, flood maps, and county floodplains	Low	Goal 1, 2	Dam Failure PR	New in 2013	

*PR = prevention, PP = property protection, S = structural, NR = natural resource protection, ES = emergency services, PI = public information

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.
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:	Ongoing 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

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: Ongoing.

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
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:	Three months to implement initial organization meeting - estimate December 2008. Estimated completion of Sheltering Annex being is June 2009.
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)
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:	Ongoing.
Status:	Implemented in 2009 and ongoing. 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.

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 bimonthly 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: Ongoing

Status: 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).
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:	Ongoing.
Status:	Implemented in 2009 and ongoing. 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.

Mitigation Action: Multi-Jurisdictional—7 Emergency Operations Plan Exercise

Jurisdiction:	Multi-Jurisdictional
Action Title:	Emergency Operations Plan Exercise
Priority:	Medium
Issue/Background:	Emergency Operation Plans need to be in alignment with the hazards facing a community.
Ideas for Implementation:	One method to test the alignment is to design exercise activities so that the emergency operations plan is activated.
Responsible Agency:	Summit County Office of Emergency Management, Emergency Manager - Joel Cochran
Partners:	Elected Leadership, Public Safety Agencies, American Red Cross, School District, St. Anthony Summit Medical Center, other non-governmental organizations and faith and service based organizations.
Potential Funding:	Incident Management Group fund
Cost Estimate:	$5000.00 to 10,000.00 annually
Benefits: (Losses Avoided)	• Readiness of agencies and personnel to act under provisions of the emergency operations plan can help mitigate loss of life and injury.
Timeline:	Annual and ongoing
Status:	New in 2013

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.

Section 2.0 Planning Process includes information on the implementation and maintenance process since the 2008 plan was adopted. This section includes information on the onging implementation and maintenance process and reflects adjustments made in the 2013 update.

5.1 Implementation

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.

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.

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 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. This activity is part of implementing Mitigation Action Multi-Jurisdictional—4. These meetings are typically scheduled on an electronic Public Safety Calendar and include:

- The Summit County Wildfire Council meets 6 times annually, with additional meetings by subcommittees working on grant management, site visits, public education programs and special projects;
- The Local Emergency Planning Committee (LEPC) meets 4 times annually;
- The Dillon Dam Security Task Force meets biannually;
- The Emergency Medical Services Board meets 6 times annually;
- The Summit County Joint Communications Center Operations Board meets monthly;
- The Joint Law Fire Administrators meet 4 times annually;
- The Public Works Directors and Utility providers meet annually in the spring to discuss snowpack and run-off expectations;
- The Sheriff's Office Special Operations coordinate avalanche education training with the Colorado Avalanche Information Center and all area ski patrol directors; and
- The Emergency Operations Center and Emergency Support Function Leads meet monthly.

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 biannually and after a hazard event to monitor progress and update the mitigation strategy. 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 Office of Emergency Management 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 2018. The County will inquire with COEM and FEMA for funds to assist with the update in 2016 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), and Flood Mitigation Assistance grant funds. The next plan update is anticipated to be completed and reapproved by COEM and FEMA Region VIII by November 2018.

5.2.3 Plan Maintenance Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions, and/or

- Increased vulnerability as a result of new development (and/or annexation).

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 5 year update cycle. Changes will 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.

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 and its intention to improve integration with the Community Wildfire Protection Plan and the multi-hazard mitigation plan in mitigation action Summit County—3 in the mitigation strategy. Progress on these efforts can be referenced in the respective action descriptions in Annex A.

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: Continue public involvement in mitigation activities. Activities related to public involvement during the 2013 update are documented in Section 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 ranked of moderate or high significance 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	2,684,337	
Courthouse Addition	208 E. Lincoln	687,156	
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	
Ambulance Building	0143 CR 450	238,185	
Sheriff Storage Barn	0192 CR 450	66,843	
Building and Grounds Shop	105 N. French Street	47,737	
Building and Grounds Office	106 N. Ridge Street	345,784	
Road and Bridge Maintenance Shop	0192 CR 450	252,569	
Tyrollean Radio Site	Barney Ford Hill	23,683	

Name of Asset	Address	Replacement Value ($)	Hazard Concerns
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	
South AWT	4344 Swan Mountain Road	82,498	
Snake River Wastewater Treatment Plant Digestor	0297 Summit County Road 120	219,475	
Wastewater Treatment Plant	4344 Swan Mountain Road	2,104,672	
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	
Temporary Fire Department Parking Garage	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
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: 2006 International Building Code
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	In process of updating to National Response Framework
Other Special Plans	Yes	Summit County Community Wildfire Protection Plan
Flood Insurance Study or Other Engineering Study for Streams	Yes	FEMA Flood Insurance Study, November 16, 2011
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)
Floodway	Flood hazards to structures; Public health, safety, and welfare	A. Compliance with County Floodplain Regulations (See Section 4100)
Geologic Hazard Areas	Avalanche paths; Landslide areas; Rock falls; Debris flows; Mudflows; Unstable slopes or soils; Seismic effects; Ground subsidence radioactivity	A. Avoiding placing any 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)
		C. Providing grading and foundation plans prepared by a registered professional engineer (See Chapter 6)
		D. Complying with recommendations of the State Geologic Survey (See Chapter 8)
		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)
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 an acre for acre basis within same ecosystem
		E. Replacing wetlands on a 2 for 1 basis outside ecosystem but within county
		F. Contributing sufficient funds to convert existing private wetlands in the unincorporated area to public domain on a 2 for 1 basis
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)
		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.

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

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.
- **3202.06 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; 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. 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. Provisions for multiple points of access.
- C. Installation of fire suppression systems.
- D. Other measures as deemed necessary to reduce the wildfire hazard.

Zoning Regulations/Overlay Districts

4100 Floodplain Overlay District

The Summit County Board of County Commissioners (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.

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.

Fire Hazard Mitigation Requirements for New Construction

Chapter 44 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 and remodels in an area rated as moderate or high fire hazard risk in unincorporated Summit County must go through a wildfire mitigation inspection process.

Summit County Community Wildfire Protection Plan, 2006, Revised 2013

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.

Wildfire Evacuation Plan, 2007

The Summit County Wildfire Evacuation Plan was created to establish a set of policies and protocol in response to wildfire occurrence. A guiding principle of the plan is that the decision to

evacuate properties should be left at the discretion of County residents themselves whenever possible. The plan outlines the official County wildfire notification system and provides specific evacuation guidelines for families in the event of a wildfire that threatens homes.

Summit County Public Health Emergency Operations Plan, 2008

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	Sheriff's Office/Emergency Manager	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	Fire Mitigation Specialist	
Warning Systems/Services	Yes	Summit County Communications Center	Reverse 911, Emergency Alert System, NOAA All-Hazards Radio, local radio, citizen text messaging system (acquiring)

Prior to 2012, Summit County had only two National Weather Service forecast points. As a result of the 2011 snowpack runoff year, Summit County OEM asked Boulder NWS to add three new forecast locations for flood advisories, including:

- On the Tenmile River traveling through Frisco
- On the Snake River traveling through Keystone
- On the Straight Creek which feeds into the lower Blue River below the Dillon Dam. This adds to the river flow previously only accounting for the release from Dillon Reservoir.

Fiscal Mitigation Capabilities

Table A.5 identifies financial tools or resources that Summit County could potentially use to help fund mitigation activities.

Table A.5. 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

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 four local fire districts: Lake Dillon Fire Protection District, Red, White, and Blue Fire Protection District, Snake River Fire Protection District, and Copper Mountain Fire Protection District. The county has an appointed Wildfire Council, has adopted a Community Wildfire Protection Plan (CWPP), and for the past three years the Board of County Commissioners has dedicated funding for wildfire risk reduction projects.
- The County operates an avalanche information line during avalanche season and works with the Colorado Avalanche Information Center.
- The County promotes fire education programs for the public and in schools.

- The Environmental Health Department regularly educates the public on disease prevention, including West Nile Virus and food safety.
- Shortly after this plan was initially completed the County was able to successfully obtain a FEMA Pre-Disaster Mitigation 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.
- Summit County, in partnership with the Summit County Wildfire Council, has created a sustainable wildfire mitigation funding source and made great strides in its fuels reduction projects in an effort to mitigate wildfire hazards; 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 lead 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, a total of 8,163 acres have been treated in the County since 2006.

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.

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 participation in and compliance with the National Flood Insurance Program. Specific activities that the County will undertake to continue compliance include the following:

- Improving education and outreach efforts about flood insurance and floodplain management programs, and continue annual flooding meetings with key stakeholders (see Mitigation Action Summit County–13).
- Reviewing flood damage prevention ordinances and identifying opportunities to strengthen requirements and enforcement (see Mitigation Action Summit County–7).
- Working with FEMA and the Colorado Water Conservation Board in the review and adoption of new digital flood insurance rate maps (see Mitigation Action Multi-Jurisdictional-7).

Mitigation Action: Summit County—1 Vulnerable Populations

Jurisdiction: Summit County

Action Title: Coordinate vulnerable populations plans.

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 Office of Emergency Management will begin a process under Emergency Support Functions 6 and 8, Mass Care and Public Health, 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 be a support 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 tomorrow if necessary. The work could be improved to include a local registry and GIS mapping.

Responsible Agency: Summit County Office of Emergency Management

Partners: All Summit County departments and other entities currently serving or servicing this population 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: Twelve months to implement after initial organization meeting - estimate September 2009.

Status: Ongoing. The actions have resulted in the establishment of a Special Needs and Vulnerable Population Advisory Committee and now recently renamed the Functional and Access Needs Advisory Committee. The committee has active participation from partners who provide specialized services to clients. The Department of Social Services and Office of Emergency Management are active in the committee.

Mitigation Action: Summit County—2 Summit County Wildfire Council

Jurisdiction: Summit County

Action Title: Support and participate in the Summit County Wildfire Council.

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. We may look for funding to support the hiring of a coordinator for this action item as it is critical to the continued success of this project. The Summit County Board of County Commissioners has allocated $200,000 in the 2008 budget for fuel reduction projects and grants countywide and is anticipating funding these projects in 2009 in the amount of $170,000.

Responsible Agency: Summit County Manager's Office

Partners: Summit County Government; Towns of Breckenridge, Dillon, Frisco, and Silverthorne; Lake Dillon 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: $45,000

Benefits: (Losses Avoided)

- Improve communication and coordination
- Protect public health and safety
- Reduce wildfire risk through fuel reduction projects

Timeline: Work within the next three months to determine if this project can be supported in the 2009 budget.

Status: Ongoing. 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. 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. The CWPP lists a full table of implementation strategies for each focus area.

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.
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; Lake Dillon 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:	This is a continuous process through the life span of these planning efforts. The degree of successful integration will be visited by the HMPC in March 2009 prior to the work season for these projects in the summer of 2009.
Status:	Ongoing. A strong link exists between the two plans. During this plan period the Wildfire Council funded the matching portion of a Pre-Disaster Mitigation Grant to put a defensible space project on the ground in the Keystone area.

Mitigation Action: Summit County—4 Summit County Forest Health Group

Jurisdiction: Summit County

Action Title: Work with the Summit County Forest Health Group (formerly referred to as Mountain Pine Beetle Task Force) to strengthen public and stakeholder educational efforts.

Priority: High

Issue/Background: The Summit County Forest Health Group 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 Fire Protection Authority

Partners: Summit County Government; Towns of Breckenridge, Dillon, Frisco, and Silverthorne; Lake Dillon 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 mountain pine beetle infestation
- Reduce losses related to wildland-urban interface fires
- Provide public education about mitigation activities

Timeline: This is an ongoing process that will be periodically visited by the HMPC. In March 2009, this action will be reviewed prior to the start of the summer construction season in 2009.

Status: Ongoing. The partnership with the Forest Health Task Force continues to be strong and productive. Homeowner series of classes are supported by speakers from the Wildfire Council and others. These meetings create an additional avenue of access to groups of people interested in conversations about hazards and mitigation activities.

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.

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 Lake Dillon 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: This will be an ongoing effort that will be reviewed annually along with other Community Wildfire Protection Plan and hazard mitigation plan reviews by the HMPC.

Status: Ongoing. This action results in the update of the CWPP mapping projects. Recently, a mapping project of defensible space work was completed and available to the public on our website. Additionally, the evacuation map book project was just updated in 2013.

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.
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:	Summit County Manager's Office, Office of Emergency Management, and GIS Department
Partners:	Summit County Government; Towns of Breckenridge, Dillon, Frisco, and Silverthorne; and Lake Dillon and Red, White, and Blue Fire Protection Districts; Summit County Wildfire Council
Potential Funding:	The Summit County Board of County Commissioners has allocated $200,000 in the 2008 budget for fuel reduction projects and grants countywide and anticipates funding these projects in 2009 in the amount of $170,000.
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:	This action is underway and will be evaluated by the HMPC and reviewed in March 2009 prior to the summer work season of 2009.
Status:	Completed. This work was completed and is in a maintenance condition.

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).
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.
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:	When new DFIRMs are adopted – estimated fall 2009
Status:	Completed. The Summit County DFIRMS were made effective in 2013 and were used to update the hazard mitigation plan risk assessment. The County has also revised its ordinance accordingly and to bring it into compliance with the State's updated Floodplain Rules.

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.

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: Dependent upon funding cycles

Status: Ongoing. The Planning Department is continually updating the Development Code as needed. The Development Code naturally incorporates many of the Multi-Hazard Mitigation Plan principles.

Mitigation Action: Summit County—9 Roadside Ditch Erosion

Jurisdiction:	Summit County
Action Title:	Develop protection plan for roadside ditches to reduce erosion and flooding.
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 armouring and sediment collection areas to existing systems.
Responsible Agency:	Summit County Road and Bridge Department
Partners:	
Potential Funding:	Summit County
Cost Estimate:	Unknown but will be 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:	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.
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:	Complete in 2008.
Status:	

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.
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:	After the DFIRMs become available, but by 2011
Status:	Ongoing. In addition the awareness to seasonal high water and potential flooding is discussed annually at a meeting with key stakeholders. During 2010 this resulted in the update of the high water material and establishment of sand bag caches as well as local sand pile distribution sites in the at risk communities.

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
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, Paul Cada
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:	2 years
Status:	New in 2013

Mitigation Action: Summit County—13 Prepare a Hazard Information and Action Guide

Jurisdiction:	Summit County
Action Title:	Prepare a Hazard Information and Action Guide
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:	2 years
Status:	New in 2013

Mitigation Action: Summit County—14 Conduct Public Education and Outreach Programs

Jurisdiction:	Summit County
Action Title:	Conduct Public Education and Outreach Programs
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:	Ongoing
Status:	New 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
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:	2 years
Status:	New in 2013

Mitigation Action: Summit County—16 Expand SCAlert Public Warning Groups

Jurisdiction:	Summit County
Action Title:	Expand SCAlert Public Warning Groups
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:	1 year
Status:	New in 2013

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
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.
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:	New 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
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:	750,000.00 pilot project
Benefits: (Losses Avoided)	Property protection and wildfire damage mitigation
Timeline:	On-going
Status:	New in 2013

Mitigation Action: Summit County—19 All-Hazards Warning System

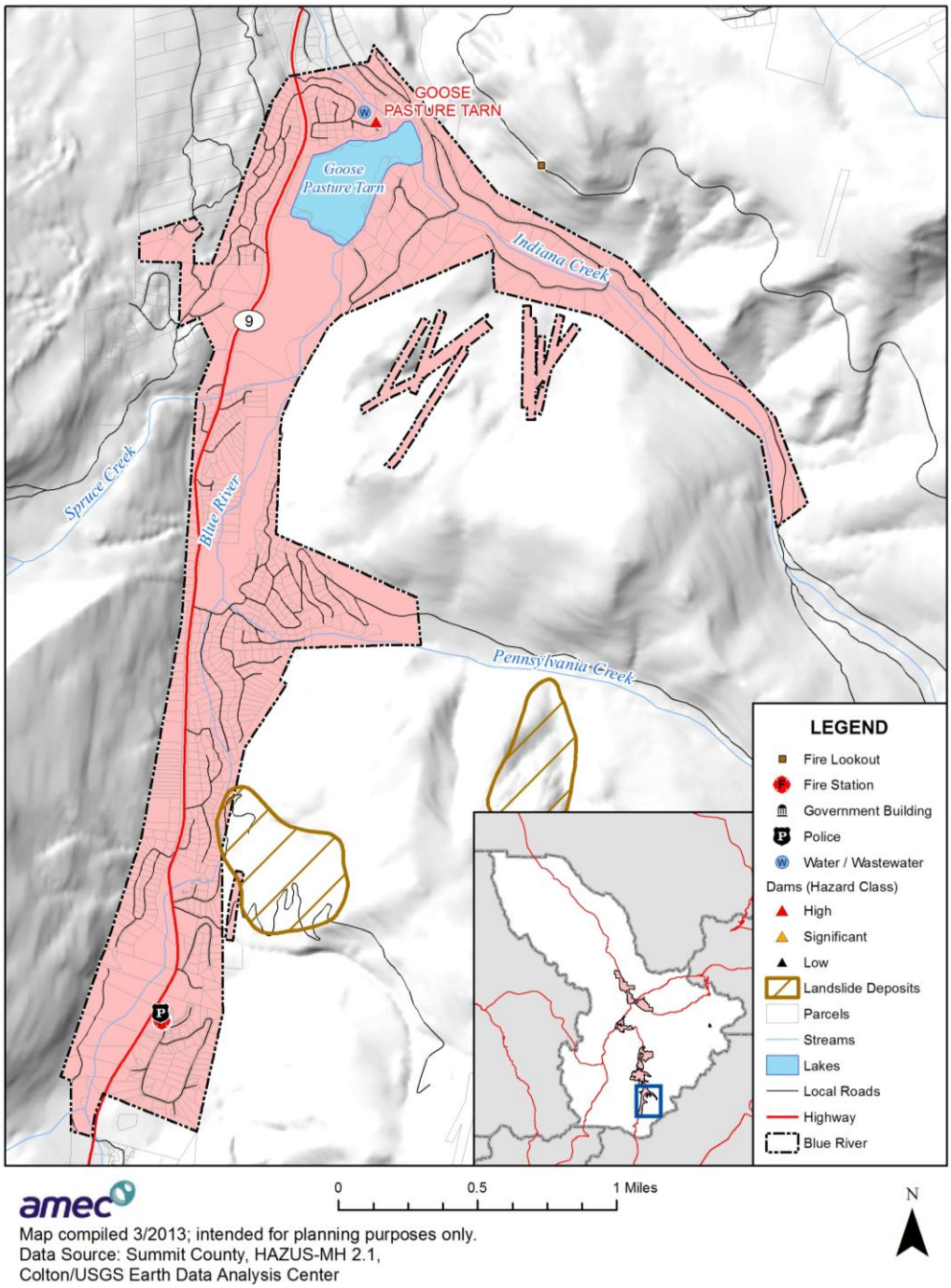
Jurisdiction:	Summit County
Action Title:	All Hazards, Emergency Services, Hazard Warning Systems Cellular Service Improvement in the Lower Blue Valley
Priority:	Medium
Issue/Background:	The improvement of cellular service in the Lower Blue would improve the ability to notify and have reported emergency 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:	Awards, Grants
Cost Estimate:	Unknown
Benefits: (Losses Avoided)	Protection of life safety, improved emergency response
Timeline:	Ongoing
Status:	New in 2013

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. The map also shows critical facilities and landslide deposits.

Figure B.1. Map of Blue River



Geography

According to the U.S. Census Bureau, 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, and Pennsylvania Creeks are all tributaries that flow into the Blue River within Town.

Population

The estimated 2011 population of Blue River was 733. The 2010 Census recorded the population at 849. Select American Community Survey (ACS) 2011 and 2010 US Census demographic and social characteristics for Blue River are shown in Table B.1.

Table B.1. Blue River—Demographic and Social Characteristics

Characteristic	2010	2011
Gender/Age		
Male (%)	57.4	53.2
Female (%)	42.6	46.8
Under 5 Years (%)	6.5	8.7
65 Years and Over (%)	5.4	10.2
Race/Ethnicity (one race)		
White (%)	98.6	94.1
Black (%)	0.5	0.0
American Indian and Alaska Native (%)	0.2	0.0
Asian (%)	0.5	4.2
Two or More Races	0.0	1.6
Hispanic or Latino (Of Any Race) (%)	2.8	6.1
Other		
Average Household Size	2.53	2.55
High School Graduate or Higher (%)	98.7	98.7

Source: U.S. Census Bureau, ACS 2011, 2010 US Census, factfinder2.census.gov/

Economy

The Town of Blue River is a residential community with little industry or commercial business. According to the 2011 ACS estimates, the industries that employed the highest percentages of Blue River's labor force were arts, entertainment, recreation, accommodation, and food services (26%); professional, scientific, management, administrative, and waste management services (21.1%); construction (15.9%); educational services, and health care and social assistance (11.6%); information (7%); retail trade (6.8%); and finance, insurance, real estate, and rental and leasing (4.7%). Select economic characteristics for Blue River from the 2011 ACS estimates and 2010 US Census are shown in Table B.2.

Table B.2. Blue River—Economic Characteristics

Characteristic	2010	2011
Families below Poverty Level	11.9%	5.3%
Individuals below Poverty Level	11.0%	8.2%
Median Home Value	$544,400	$544,800
Median Household Income	$78,750	$95,139
Per Capita Income	$37,876	$39,243
Population in Labor Force*	564	539

Source: ACS (2011), 2010 US Census, factfinder2.census.gov/
*Age 16 years and over

B.2 Hazard Identification and Profiles

Blue River'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 B.3). In the context of the countywide planning area, there are no hazards that are unique to Blue River.

Table B.3. Blue River—Hazard Summary

Hazard Type	Geographic Extent*	Probability*	Magnitude*	Hazard Rating
Avalanche	Isolated	Unlikely	Limited	Low
Dam Failure	Small	Unlikely	Critical	Moderate
Drought	Large	Occasional	Limited	Low
Earthquake	Large	Unlikely	Limited	Low
Erosion/Deposition	Small	Likely	Critical	Moderate
Flood	Small	Occasional	Limited	Moderate
Hazardous Materials Release (Transportation)	Isolated	Unlikely	Limited	Low
Landslide, Mudflow/Debris Flow, and Rock Fall	Small	Occasional	Limited	Low
Lightning	Large	Likely	Limited	Low
Mountain Pine Beetle Infestation	Small	Highly Likely	Limited	Moderate
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Large	Likely	Critical	High
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 of the main plan.

B.3 Vulnerability Assessment

The intent of this section is to assess Blue River's vulnerability 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. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of moderate or high significance that may vary from other parts of the planning area. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment in the main plan.

Community Asset Inventory

Table B.4 shows the total population, number of structures, land value, and assessed value of improvements to parcels in Blue River. Land values have been purposely excluded from the Total Value because land remains following disasters, and subsequent market devaluations are frequently short-term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

Table B.4. Blue River—Maximum Population and Building Exposure

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value*	Total Value**
Mixed Use	1	0	$110,601	$0	$0	$0
Residential	894	673	$172,201,088	$272,173,284	$136,086,642	$408,259,926
Total	**895**	**673**	**$172,311,689**	**$272,173,284**	**$136,086,642**	**$408,259,926**

Source: Summit County Assessor 2013
*Content Value estimated; **Includes contents and improvements only

Blue River's planning team identified two community assets. The first is the Town Hall, with an estimated replacement value of $350,000. The Town is looking at future expansion of the facility to include a community center in conjunction with the Town Hall offices and Council Chambers. The second asset is the Town Park, with an estimated replacement value of $200,000. The locations of critical facilities in Blue River identified by Summit County GIS are illustrated in Figure B.2.

Vulnerability by Hazard

This section analyzes existing and future structures and other assets at risk to hazards ranked of medium or high significance that vary from the risks facing the entire planning area and estimates potential losses. These hazards include dam failure, flood, and wildfire.

Dam Failure

Existing Development

The Goose Pasture Tarn is located on the Blue River on the north end of Town and has a maximum storage capacity of approximately 2,000 cubic feet. There is no data available to indicate any likelihood of failure, nor is there an inundation map available. Therefore, structures and potential loss estimates in these areas could not be calculated. There are parcels located

within the Town of Blue River downstream of the dam. The dam does have a high hazard ranking indicating that loss of life is likely to result from its failure.

An Emergency Action Plan has been completed. The Town also lies downstream of the Upper Blue Lake Dam and would be impacted by a dam failure event.

Future Development

A dam failure would likely result in impacts greater than the 100-year flood event modeled by HAZUS in the analysis below. The Town should consider the dam failure hazard when permitting development downstream of the dam.

Flood

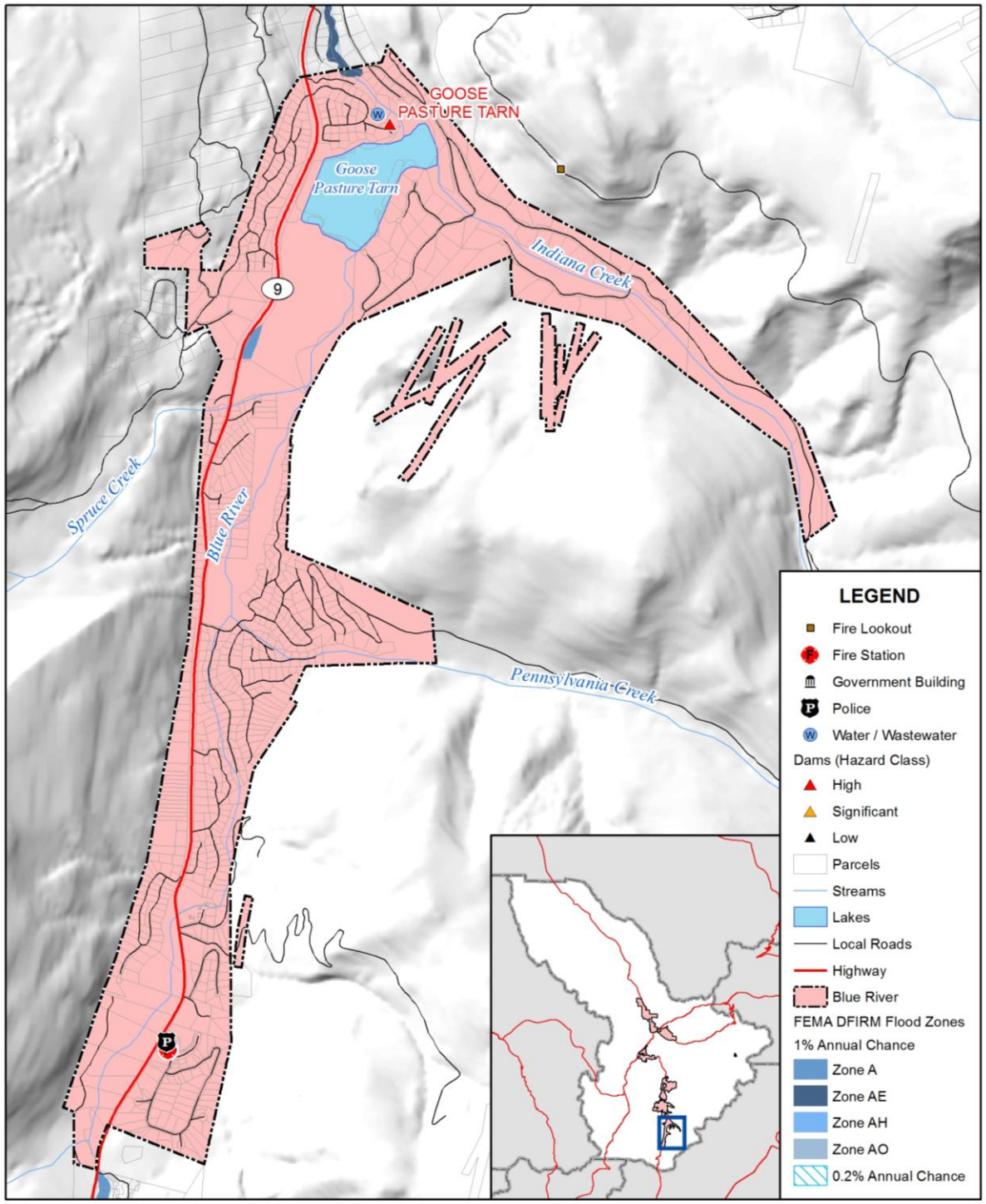
Existing Development

The Goose Pasture Tarn 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, 2001).

The Town's DFIRM became effective on November 16, 2011, but Blue River does not currently participate in the NFIP. The DFIRM was used to generate a one percent annual flood, or 100-year flood, event in the Town of Blue River.

Figure B.2 shows the Town's 1% annual chance flood zone based on the DFIRM, as well as critical facilities.

Figure B.2. DFIRM and Critical Facilities in Blue River



amec

0 0.5 1 Miles

N

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, Preliminary DFIRM

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, which assumes that improved parcels have a structure of some type. The DFIRM flood zones were overlaid in GIS on the parcel centroid data to identify structures that would likely be inundated during a 1% annual chance and 0.2% annual chance flood event. An effort was made to remove centroids from the analysis that may have been located within a flood zone, but the actual structure, based on imagery interpretation, was located outside of the flood hazard area. Building improvement values for the points were based on the assessor's data. Property exposure located in flood hazard zones by land use type is shown in Table B.5. Blue River's exposure is minimal; the Town has only one parcel, located in the AE Zone, with a total value of $0.

Building related losses are shown in Table B.6, which indicates no losses for the Town of Blue River Based on the DFIRM, no structures or parcels are located in the 1% annual chance flood zone in Blue River. More information on the methodology for this loss estimation can be found in the Section 3.3 Vulnerability Assessment in the main plan.

There are no critical facilities located in the floodplain.

Table B.5. Blue River—Flood Exposure by Land Use

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Zone AE						
Residential	1	0	$0	$0	$0	$0
Total	**1**	**0**	**$0**	**$0**	**$0**	**$0**

Source: AMEC analysis of DFIRM

Table B.6. DFIRM 1% Annual Chance Flood Estimated Building Losses

Flood Zone	Improved Parcel Count	Improved Value	Estimated Content Value	Total Value	Loss Estimate	Loss Ratio
Zone AE	0	$0	$0	$0	$0	0.0%
Total	**0**	**$0**	**$0**	**$0**	**$0**	**0.0%**

Source: AMEC analysis of DFIRM

National Flood Insurance Program

The Town of Blue River does not participate in the NFIP. Its FIRM became effective on November 16, 2011, but the Town is currently under sanction.

Future Development

Blue River does not have a floodplain ordinance. 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

Existing Development

Potential losses for landslide areas were estimated using Summit County GIS and assessor's data and were examined in terms of values and critical facilities at risk. GIS was used to create a centroid, or point, representing the center of each parcel polygon, which was overlayed on the landslide hazard polygons. The assessor's land and 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 polygon, that parcel is assumed to be at risk to the landslide. Values were summed and sorted by landslide hazard zone. Additional landslide hazard analysis was completed using the more comprehensive USGS landslide deposits layer during the 2013 update. The results of the overlay analysis for the Town of Blue River are presented in Table B.7.

Table B.7. Blue River—Landslide Exposure by Land Use

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Colton Landslide Deposits						
Residential	3	1	$247,069	$256,639	$128,320	$384,959
Total	**3**	**1**	**$247,069**	**$256,639**	**$128,320**	**$384,959**

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.

Wildfire

Existing Development

A wildfire threat ranking was developed for the Summit County Community Wildfire Protection Plan by the County, fire protection districts, and U.S. Forest Service. It is based on fuel hazards, risk of wildfire occurrence, essential infrastructure at risk, community values at risk, and local preparedness and firefighting capability and classifies the wildfire threat as low, medium, high, and extreme. The wildfire threat GIS layer, updated in 2011, was used to determine the number of acres in each wildfire threat zone and map the wildfire threat in Blue River (see Table B.8 and Figure B.3). Figure B.4 shows the wildfire focus areas from the County CWPP and treatment areas in Blue River.

Table B.8. Blue River—Acreage in Wildfire Threat Zones

Low		Medium		High		Extreme		
Acres	%Total	Acres	%Total	Acres	%Total	Acres	%Total	Total Acres
420	29%	1,042	71%	10	0.7%	-	-	1,471

Source: Summit County

Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard, the property values in Blue River were separated into wildfire threat zones. The breakdown of property values by wildfire threat zone is shown in Table B.9.

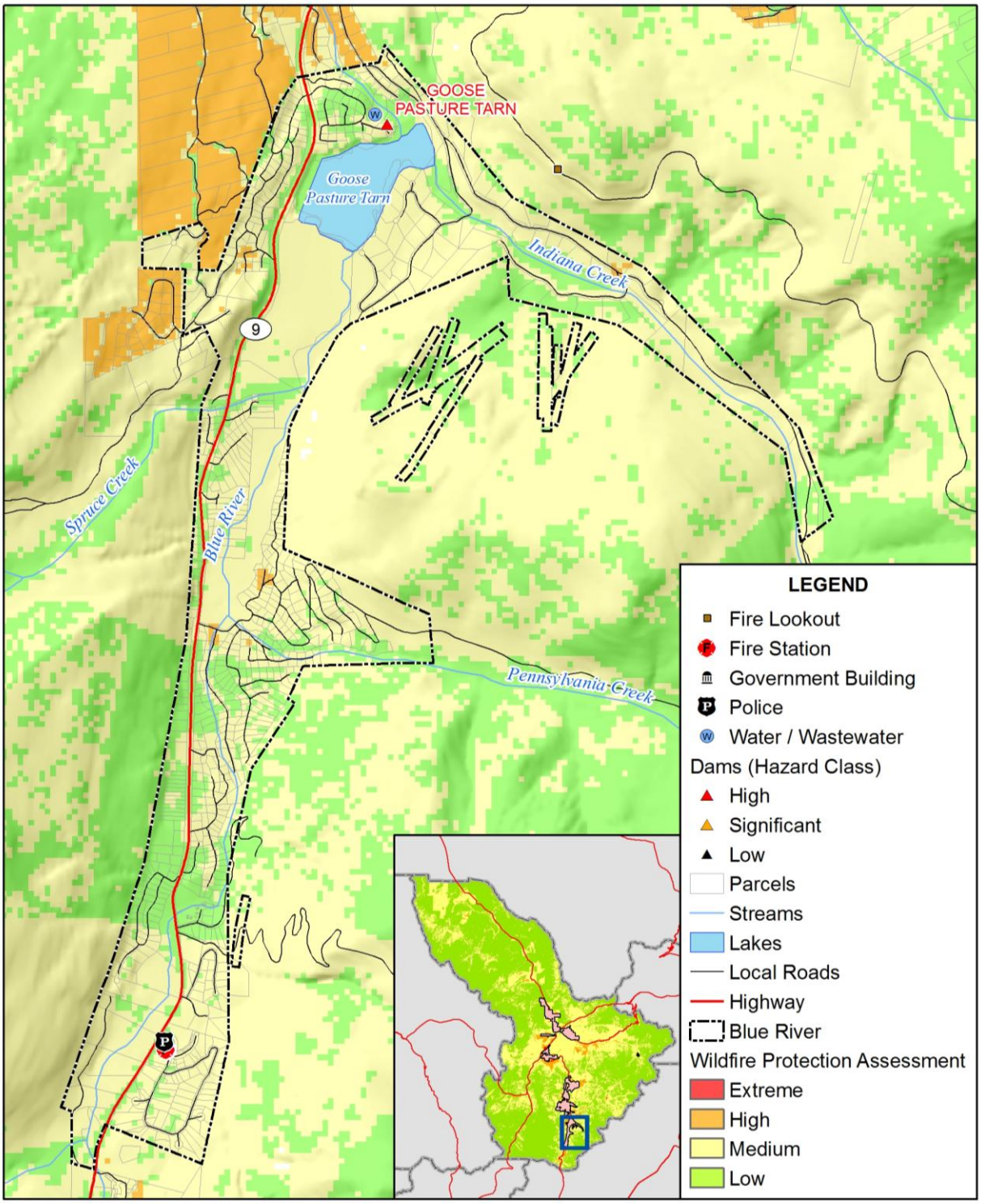
Table B.9. Blue River—Property Values in Wildfire Threat Zones

Threat Zone	Land Use	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Low	Residential	192	$39,208,553	$65,519,784	$32,759,892	$98,279,676
Medium	Residential	471	$110,761,869	$203,891,916	$101,945,958	$305,837,874
High	Residential	10	$1,875,649	$2,761,584	$1,380,792	$4,142,376
Totals		**673**	**$151,846,071**	**$272,173,284**	**$136,086,642**	**$408,259,926**

Source: AMEC analysis with County data

There are no critical facilities located in high or extreme wildfire threat areas in Blue River. Seven hundred and seventy (770) buildings are located in Blue River's wildfire hazard areas, based on footprint count. This includes 22 buildings in high wildfire threat zones, 566 in medium threat zones, and 182 in low threat zones.

Figure B.3. Wildfire Threat and Critical Facilities in Blue River



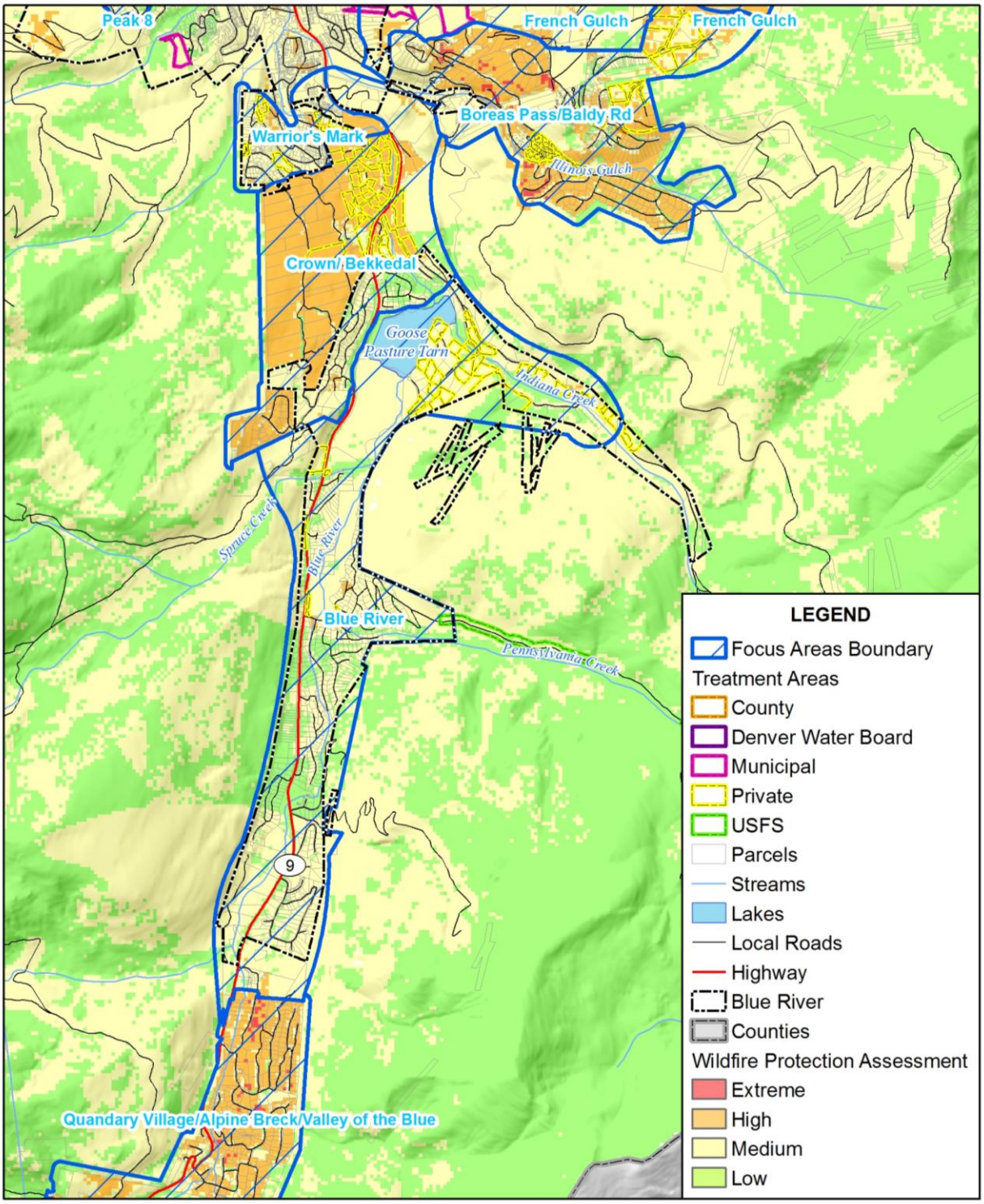
amec

0 0.5 1 Miles

N

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

Figure B.4 Wildfire Focus Areas and Treatment Areas in Blue River



amec

0 0.75 1.5 Miles

N

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County

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.

Future Development

New construction in Blue River must meet defensible space regulations, which is included in the Town's code.

Growth and Development Trends

Table B.10 illustrates how Blue River has grown in terms of population and number of housing units between 2000 and 2011.

Table B.10. Blue River—Change in Population and Housing Units, 2000-2011

2000 Population	2011 Population Estimate	Estimated Percent Change 2000-2011	2000 # of Housing Units	2011 Estimated # of Housing Units	Estimated Percent Change 2000-2011
685	733	+7	563	642	+14

Source: ACS 2011, factfinder2.census.gov

According to the *Demographic and Economic Trends Benchmark Report* for Blue River, the Town "contains a significant portion of second homes with a 42% seasonal occupancy in 2010 according to the Census. But it increasingly serves as a year-round home to local and regional working households and retirees" (pg. 3). The report also found that total growth in housing units exceeds population growth, supporting the finding that many of the homes built in Blue River are second or seasonal homes. There are no commercial storefronts in the Town; rather, people work out of their homes. There is far less pressure to develop commercial real estate in Blue River.

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 five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, and mitigation outreach and partnerships.

Regulatory Mitigation Capabilities

Table B.11 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.11. 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	No	Being addressed in Comprehensive Master Plan
Floodplain Ordinance	No	
Other Special Purpose Ordinance	Yes	Wildfire mitigation standards
Building Code	Yes	In process of updating with Summit County
Fire Department ISO Rating	Yes	Rating: 9
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	Included in Comprehensive Master Plan
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 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 Codes[1]. (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

[1] See Chapter 18 of this Code.

Administrative/Technical Mitigation Capabilities

Table B.12 identifies the personnel responsible for activities related to mitigation and loss prevention in Blue River.

Table B.12. 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	Contract position.
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	Contract position.
Floodplain Manager	No		Handled by contract Engineer
Emergency Manager	Yes	Mayor	Responsibility assigned to Mayor in Town Charter
Grant Writer	Yes	Mayor and Council	Added duties to elected officers
Other Personnel	Yes	Town Clerk	
Warning Systems/Services	Yes		Provided by Summit County Communications Center

Fiscal Mitigation Capabilities

Table B.13 identifies financial tools or resources that Blue River could potentially use to help fund mitigation activities.

Table B.13. 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	

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.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.

Priority: High

Background/Issue:

Responsible Agency: Town of Blue River

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: Next five years

Status: This project has been completed by the Town of Blue River in 2009. The timing for replacement of two bridges that served as primary ingress and egress into these subdivisions required they allocate town funds to complete the projects. The culvert of the one bridge was failing and at the time was the only ingress and egress into the subdivision. This lead to the new construction of the second bridge not identified in this project as well as total replacement of the bridge in this project. Both were constructed to the 100 year flood standard and with weight considerations so that all fire apparatus can travel over the bridges.

Mitigation Action: Blue River—2 Defensible Space Program

Jurisdiction: Town of Blue River

Action Title: Continue homeowner defensible space program begun in 2007

Priority: Medium

Background/Issue: Mountain pine beetle 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

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: Ongoing. Every year as budget permits.

Status: The Town is on an annual basis partnering with homeowners and the Wildfire Council for Summit County on defensible space projects. This is ongoing and will continue into the future. The Town has continued to maintain a line item in their budget to support the application for matching grant funds. As the Town budget would allow the expenditures for this item could be increased.

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
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
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:	Establish agreement with County and begin when the Town has the funds.
Status:	This project will be completed by September 2013 in coordination with Summit County. The majority of the road usage comes from visitation to the forest service trailhead located at the end of the road, only about 10% is local resident usage. The Town was able to secure town funds for their share of the costs from their budget. The work in the fall of 2013 will complete this project.

Mitigation Action: Blue River—4 Augment Water Supply

Jurisdiction:	Town of Blue River
Action Title:	Wildfire – Structural Project – Augment water supply – Cistern Project
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
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 fire fighting 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:	2-5 years and on-going
Status:	New in 2013

Mitigation Action: Blue River—5 Comprehensive Master Plan

Jurisdiction:	Town of Blue River
Action Title:	All Hazards – Prevention– Comprehensive Master Plan
Priority:	High
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
Partners:	
Potential Funding:	Town funds
Cost Estimate:	
Benefits: (Losses Avoided)	The plan will provide the Town with a comprehensive planning strategy for the future.
Timeline:	2-5 year and 5-20 year vision being drafted
Status:	New in 2013

Mitigation Action: Blue River—6 Regrade Spruce Creek Road

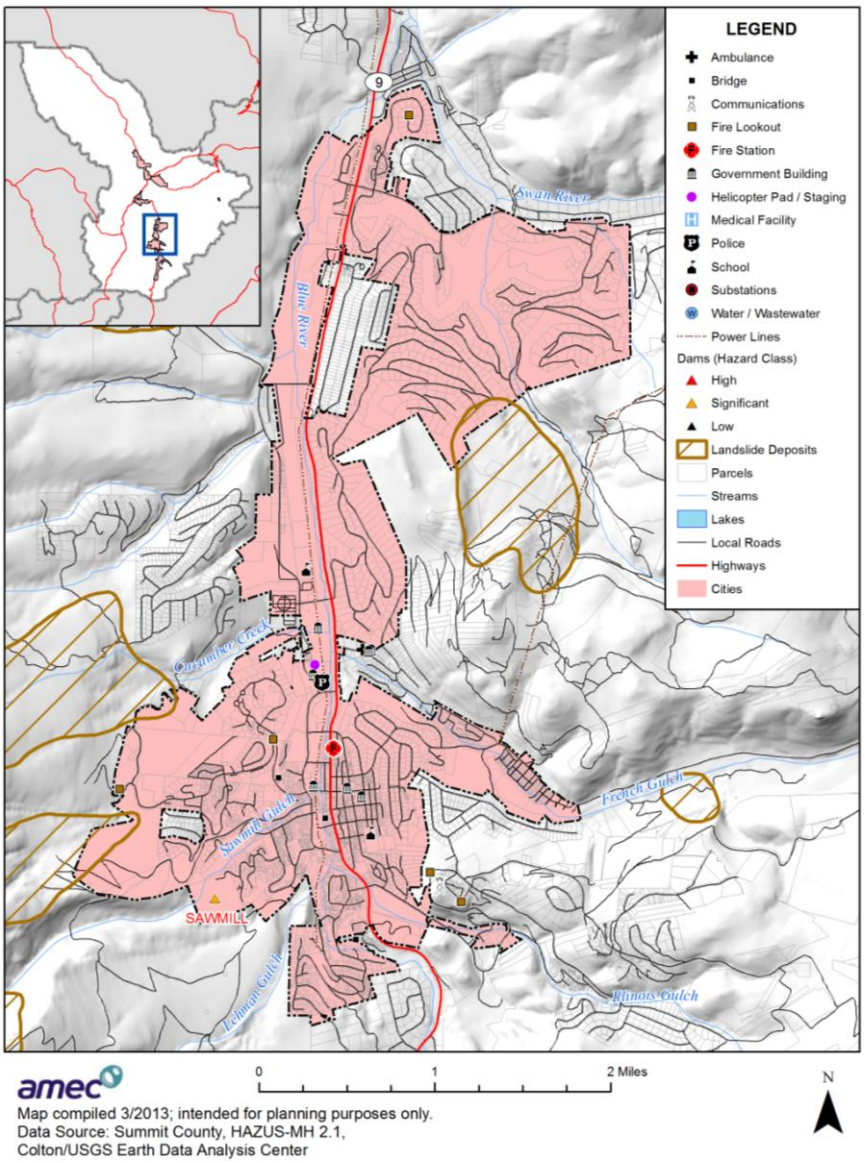
Jurisdiction:	Town of Blue River
Action Title:	All Hazards – Structural Project – Re-alignment of Spruce Creek Road with Colorado Highway 9
Priority:	High
Background/Issue:	The Town is looking into a seasonal closure as one alternative to addressing the safety hazard at the Spruce Creek Road and Highway 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
Partners:	Colorado Department of Transportation
Potential Funding:	Grants, Awards, State and Town funds
Cost Estimate:	TBD
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:	2-5 years and on-going
Status:	New in 2013

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. The map also shows critical facilities and landslide deposits.

Figure C.1. Map of Breckenridge



Geography

The Town of Breckenridge encompasses approximately 3,700 acres of land, ranging in elevation from 9,017 to 14,265 feet and including a portion of the Continental Divide. 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.

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 4,351 in 2011 and at 4,540 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 2009 was estimated at 38,624. 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 American Community Survey (ACS) 2011 and 2010 US Census demographic and social characteristics for Breckenridge's "permanent" population are shown in Table C.1.

Table C.1. Breckenridge—Demographic and Social Characteristics

Characteristic	2010	2011
Gender/Age		
Male (%)	55.7	52.9
Female (%)	44.3	47.1
Under 5 Years (%)	4.3	6.0
65 Years and Over (%)	5.8	11.2
Race/Ethnicity (one race)		
White (%)	93.1	91.3
Black or African American (%)	0.7	1.4
American Indian and Alaska Native (%)	0.1	4.5
Asian (%)	1.2	0.3
Other (%)	3.4	5.1
Hispanic or Latino (Of Any Race) (%)	9.0	11.7

Characteristic	2010	2011
Other		
Average Household Size	2.09	2.23
High School Graduate or Higher (%)	99.1	99.7

Source: ACS 2011, 2010 US Census, factfinder2.census.gov

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.

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 the ACS 2011 estimates, the industries that employed the highest percentage of Breckenridge's labor force were arts, entertainment, recreation, accommodation, and food services (38.5%); professional, scientific, and management, and administrative and waste management services (12.0%); retail trade (11.1%); and finance, insurance, real estate, and rental and leasing (8.3%). Select economic characteristics for Breckenridge from the 2011 ACS estimates and 2010 US Census are shown in Table C.2.

Table C.2. Breckenridge—Economic Characteristics

Characteristic	2010	2011
Families below Poverty Level	3.2%	0.0%
Individuals below Poverty Level	7.6%	4.4%
Median Home Value	$682,100	$465,000
Median Household Income	$54,000	$55,982
Per Capita Income	$31,087	$30,443
Population in Labor Force*	3,733	3,725

Source: ACS 2011, 2010 US Census, factfinder2.census.gov
*Age 16 years and over

C.2 Hazard Identification and Profiles

Breckenridge'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 C.3). In the context of the countywide planning area, there are no hazards that are unique to Breckenridge.

Table C.3. Breckenridge—Hazard Summary

Hazard Type	Geographic Location*	Probability*	Magnitude*	Hazard Rating
Avalanche	Isolated	Unlikely	Limited	Low
Dam Failure	Small	Unlikely	Critical	Moderate
Drought	Large	Occasional	Limited	Moderate
Earthquake	Large	Unlikely	Limited	Low
Erosion/Deposition	Small	Likely	Limited	Low
Flood	Small	Likely	Critical	High

Hazard Type	Geographic Location*	Probability*	Magnitude*	Hazard Rating
Hazardous Materials Release (Transportation)	Isolated	Unlikely	Critical	Low
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Occasional	Limited	Low
Lightning	Large	Likely	Critical	Moderate
Mountain Pine Beetle Infestation	Medium	Highly Likely	Limited	Moderate
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Large	Likely	Catastrophic	High
Windstorm	Large	Likely	Limited	Low

*See Section 3.2 for definitions of these factors

The likelihood of mud and debris flow is small within the Town limits. There is no historic evidence of large debris flows.

Information on past events for each hazard can be found in Section 3.2 Hazard Profiles in the body of this document.

C.3 Vulnerability Assessment

The intent of this section is to assess Breckenridge's vulnerability separately from that of the planning area as a whole, which has already been addressed in Section 3.3 Vulnerability Assessment. The following vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of moderate or high significance that may vary from other parts of the planning area. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment.

Community Asset Inventory

Table C.4 shows the total population, number of structures, land value, and assessed value of improvements to parcels in Breckenridge. Land values have been purposely excluded from the Total Value because land remains following disasters, and subsequent market devaluations are frequently short-term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

Table C.4. Breckenridge—Maximum Population and Building Exposure

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Land Value	Estimated Content Value	Total Value*
Commercial	203	132	$109,464,599	$113,100,251	$113,100,251	$226,200,502
Government	66	1	$51,950	$632,820	$632,820	$1,265,640
Industrial	10	6	$1,725,914	$7,447,916	$11,171,874	$18,619,790
Mixed Use	68	44	$24,857,850	$268,864,644	$268,864,644	$537,729,288
Other	195	10	$11,939,599	$119,433,986	$119,433,986	$238,867,972
Residential	2,992	2,478	$963,674,870	$2,881,539,697	$1,440,769,849	$4,322,309,546

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Land Value	Estimated Content Value	Total Value*
Total	**3,534**	**2,671**	**$1,111,714,782**	**$3,391,019,314**	**$1,953,973,424**	**$5,344,992,738**

Source: Summit County Assessor 2013
*Content Value estimated

Table C.5 lists critical facilities and other community assets identified by Breckenridge's planning team as extremely important to protect in the event of a disaster.

Table C.5. Breckenridge—Critical Facilities and Other Community Assets

Name of Asset	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Info/Comments
Breckenridge Town Hall	3,000,000	N/A	Governmental operations for the Town of Breckenridge
Breckenridge Police Department	4,500,000–facility 150,000–equipment	N/A	Public safety (law enforcement) services for the Town of Breckenridge
Red, White, and Blue Fire District	4,000,000–facilities 3,000,000–equipment	N/A	Public safety (fire/EMS) services for the Upper Blue Valley
Carriage House	1,400,000	104	Childcare facility
Little Red Schoolhouse	1,560,000	102	Childcare facility
Timberline Learning Center	3,900,000		Childcare facility
Breckenridge Elementary	10,000,000	310	Public school
Upper Blue Elementary	10,000,000	275	Public school
Transit Centers	950,000	N/A	Public transportation
Water Treatment Facilities	5,800,000	N/A	Provides safe, healthy water for citizens and guests
Water Storage Facilities	9,592,524	N/A	Provides a water supply for citizens and guests
Colorado State Highway 9	–		Main thoroughfare in and out of Breckenridge
Boreas Railroad Station Site	147,000		On Colorado State Register of Historic Properties and National Register of Historic Places
Breckenridge Historic District	660,000		On Colorado State Register of Historic Properties and National Register of Historic Places

Sources: Town of Breckenridge; Directory of Colorado State Register Properties, www.coloradohistory-oahp.org/programareas/register/1503/; National Register Information System, www.nr.nps.gov/

The locations of critical facilities in Breckenridge identified by Summit County GIS are illustrated in Figure C.2 DFIRM and Critical Facilities in Breckenridge.

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 other is the Block 11 planned development on Airport Road in Breckenridge, which consists of more than 400 units.

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.

Vulnerability by Hazard

This section examines those existing and future structures and other assets at risk to hazards ranked of moderate or high significance that vary from the risks facing the entire planning area and estimates potential losses. These hazards include dam failure, flood, and wildfire.

Dam Failure

Existing Development

The Goose Pasture Tarn is located upstream of Breckenridge and has a maximum storage capacity of approximately 812 acre-feet. The Sawmill Reservoir Dam is also located upstream. Likelihood of failure is based on a dam's inspection rating, which in the case of both of the Breckenridge dams is conditionally satisfactory. An inundation map is included in the most recent Emergency Action Plan dated December 2006; however the inundation maps were not available for this project. Therefore, structures and potential loss estimates in these areas could not be calculated. The Goose Pasture Tarn Dam does have a high hazard ranking indicating that loss of life is likely to result from its failure.

Future Development

There are probably no 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, Sawmill Gulch, Illinois Gulch, and Lehman Gulch, which is mostly likely to occur in mid-June due to runoff from snowmelt. According to the 2011 Flood Insurance Study, stream gage records indicate that 97 percent of the annual peak flow in the Blue River basin has been the result of melting winter snow accumulations. The largest discharge recorded during 64 years of record on the Blue River near Dillon was 1,250 cubic feet per second on June 17, 1965. The high discharge was a result of snowmelt and a high-intensity thunderstorm center centered on a tributary above the Town of Breckenridge; it was a 2 percent annual chance flood event. 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 the major crossings. Some shallow flooding is caused by the culverts backing up and overland flow from gulches (FEMA, 2011).

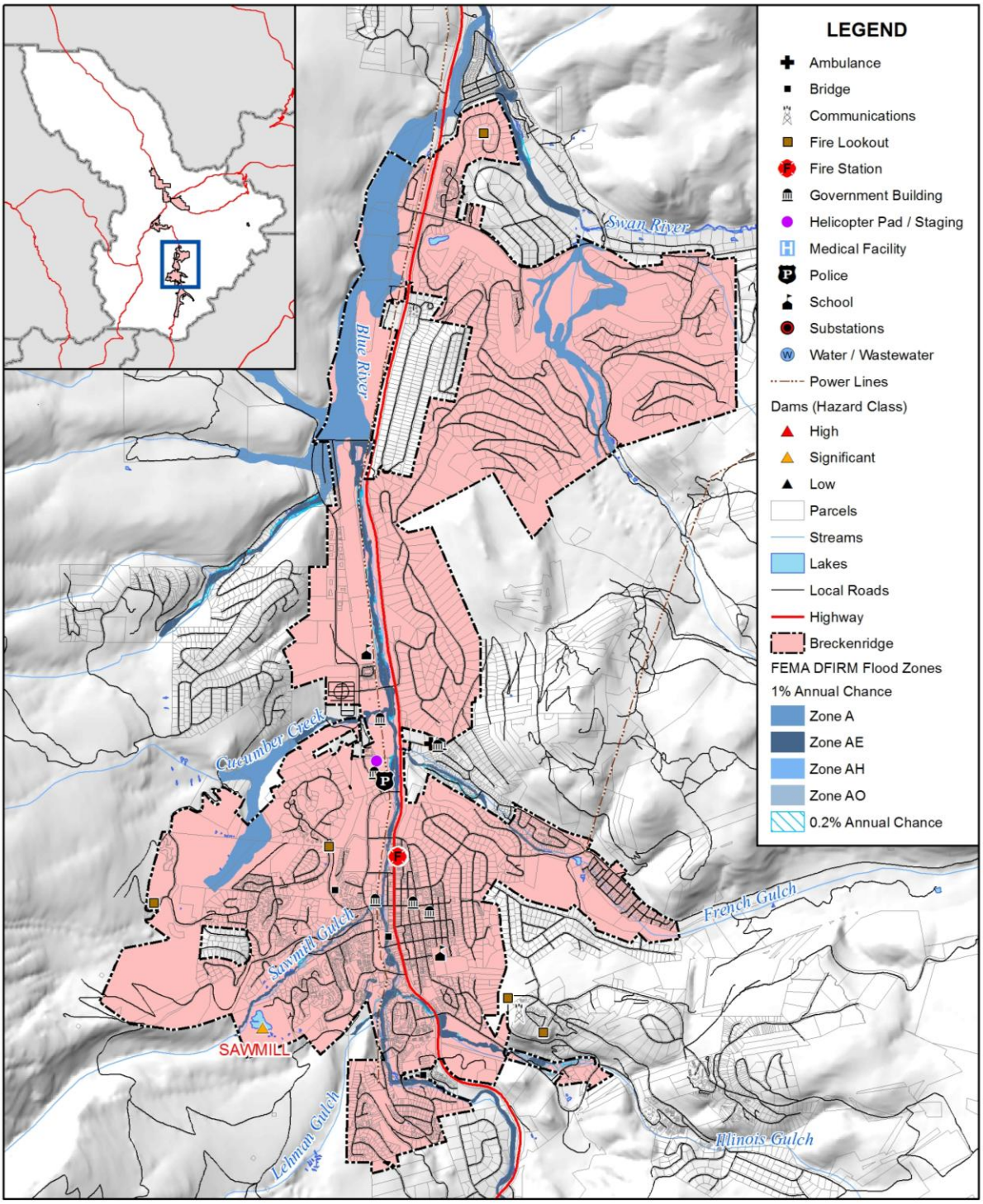
The Goose Pasture Tarn, a small reservoir immediately upstream of Breckenridge, also serves as a flood protection measure for the Blue River. The tarn has a drainage area of approximately 43.5 square miles, a storage capacity of nearly 1,000 acre feet, and a spillway design capacity of 5,000 cubic feet per second. 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).

Existing Development

The Town's DFIRM became effective on November 16, 2011.

The DFIRM was used to generate a 1% and 0.2% annual chance flood event in the Town of Breckenridge. Figure C.2 shows the DFIRM and critical facilities.

Figure C.2. DFIRM and Critical Facilities in Breckenridge



amec

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, Preliminary DFIRM

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, which assumes that improved parcels have a structure of some type. The DFIRM flood zones were overlaid in GIS on the parcel centroid data to identify structures that would likely be inundated during a 1% annual chance and 0.2% annual chance flood event. An effort was made to remove centroids from the analysis that may have been located within a flood zone, but the actual structure, based on imagery interpretation, was located outside of the flood hazard area. Building improvement values for the points were based on the assessor's data. Property exposure located in flood hazard zones by land use type is shown in Table C.6. Breckenridge's AE Zone has the highest exposure with a total value of nearly $350 million.

Building related losses are shown in Table C.7, which indicates a total loss estimate of over $101 million. Flooded structures for the 1% and 0.2% annual chance floods are depicted in Figure C.3. Table C.8 summarizes the footprint count in Breckenridge's flood hazard area. More information on the methodology used for this loss estimation can be found in Section 3.3 Vulnerability Assessment.

There are no critical facilities located in the floodplain in Breckenridge.

Table C.6. Breckenridge—Flood Exposure by Land Use

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Zone A						
Commercial	5	1	$2,045,079	$1,754,139	$1,754,139	$3,508,278
Mixed Use	6	2	$3,711,841	$188,203	$188,203	$376,406
Other	10	0	$327,312	$0	$0	$0
Residential	10	10	$3,049,124	$10,180,832	$5,090,416	$15,271,248
Total	**31**	**13**	**$9,133,356**	**$12,123,174**	**$7,032,758**	**$19,155,932**
Zone AE						
Commercial	3	2	$1,541,678	$759,333	$759,333	$1,518,666
Government	5	0	$0	$0	$0	$0
Mixed Use	6	6	$772,633	$122,110,696	$122,110,696	$244,221,392
Other	7	1	$1,295,722	$607,430	$607,430	$1,214,860
Residential	26	23	$5,673,046	$68,610,362	$34,305,181	$102,915,543
Total	**47**	**32**	**$9,283,079**	**$192,087,821**	**$157,782,640**	**$349,870,461**
Zone AO						
Residential	8	7	$2,311,849	$23,614,974	$11,807,487	$35,422,461
Total	**8**	**7**	**$2,311,849**	**$23,614,974**	**$11,807,487**	**$35,422,461**
0.2% Annual Chance						
Mixed Use	1	1	$924,897	$255,415	$255,415	$510,830
Residential	4	3	$1,421,213	$1,575,863	$787,932	$2,363,795
Total	**5**	**4**	**$2,346,110**	**$1,831,278**	**$1,043,347**	**$2,874,625**

Source: AMEC analysis of DFIRM

Table C.7. Breckenridge—DFIRM 1% and 0.2% Annual Chance Flood Estimated Building Losses

Flood Zone	Improved Parcel Count	Improved Value	Estimated Content Value	Total Value	Loss Estimate	Loss Ratio
Zone A	13	$12,123,174	$7,032,758	$19,155,932	$4,788,983	0.1%
Zone AE	32	$192,087,821	$157,782,640	$349,870,461	$87,467,615	1.6%
Zone AO	7	$23,614,974	$11,807,487	$35,422,461	$8,855,615	0.2%
1% Annual Chance	52	$227,825,969	$176,622,885	$404,448,854	$101,112,214	1.9%
0.2% Annual Chance	4	$1,831,278	$1,043,347	$2,874,625	$718,656	0.01%
Total	**56**	**$229,657,247**	**$177,666,232**	**$407,323,479**	**$101,830,870**	**1.9%**

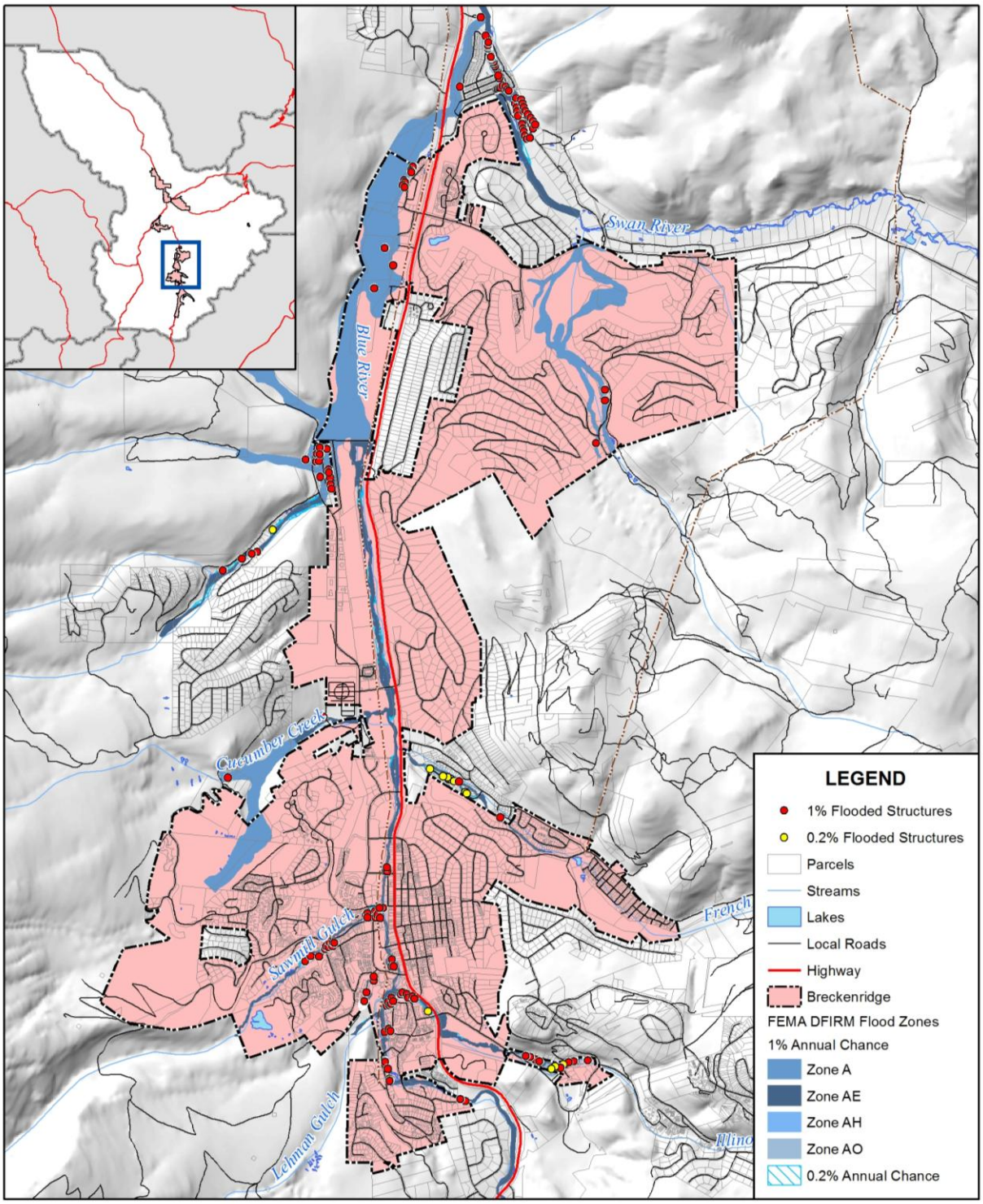
Source: AMEC analysis of DFIRM

Table C.8. Breckenridge Building Footprints in DFIRM Flood Zones

Flood Zone	Footprint Count
Zone A	38
Zone AE	36
Zone AO	8
1% Annual Chance	82
0.2% Annual Chance	3
Total	**85**

Source: AMEC analysis of DFIRM

Figure C.3. DFIRM and Floodprone Properties in Breckenridge



amec

Map compiled 5/2013; intended for planning purposes only.
Data Source: Summit County, Preliminary DFIRM

National Flood Insurance Program

Breckenridge joined the National Flood Insurance Program (NFIP) on June 4, 1980. NFIP insurance data indicates that as of March 25, 2013, there were 46 flood insurance policies in force in the County with $10,905,700 of coverage. This is an increase of 27 policies since 2008. Thirteen of the policies were in A zones, and 33 were located outside of the Special Flood Hazard Area.

There have been two historical claims for flood losses totaling $28,060. There were no repetitive or severe repetitive loss structures.

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).

Existing Development

Potential losses for landslide areas were estimated using Summit County GIS and assessor's data and were examined in terms of values and critical facilities at risk. GIS was used to create a centroid, or point, representing the center of each parcel polygon, which was overlaid on the landslide hazard polygons. The assessor's land and 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 polygon, that parcel is assumed to be at risk to the landslide. Values were summed and sorted by landslide hazard zone. Additional landslide hazard analysis was completed using the more comprehensive USGS landslide deposits layer during the 2013 update. The results of the overlay analysis for the Town of Breckenridge are presented in Table C.9. Breckenridge has 13 building footprints in Colton landslide deposit areas based on data obtained from Summit County.

Table C.9. Breckenridge—Landslide Exposure by Land Use

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Colton Landslide Deposits						
Other	2	0	$0	$0	$0	$0
Residential	5	4	$1,297,960	$3,971,600	$1,985,800	$5,957,400
Total	**7**	**4**	**$1,297,960**	**$3,971,600**	**$1,985,800**	**$5,957,400**

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

Existing Development

A wildfire threat ranking was developed for the Summit County Community Wildfire Protection Plan by the County, fire protection districts, and U.S. Forest Service. It is based on fuel hazards, risk of wildfire occurrence, essential infrastructure at risk, community values at risk, and local preparedness and firefighting capability and classifies the wildfire threat as low, medium, high, and extreme. The wildfire threat GIS layer, updated in 2011, was used to determine the number of acres in each wildfire threat zone and map the wildfire threat in Breckenridge (see Table C.10 and Figure C.4). Figure C.5 shows the wildfire focus areas from the County CWPP and treatment areas in Breckenridge.

Table C.10. Breckenridge—Acreage in Wildfire Threat Zones

Low		Medium		High		Extreme		
Acres	%Total	Acres	%Total	Acres	%Total	Acres	%Total	Total Acres
477	12%	3,259	85%	86	2%	2	0.06%	3,824

Source: AMEC analysis with County data

Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard, the property values in Breckenridge were separated into wildfire threat zones. The breakdown of property values in Breckenridge by wildfire threat zone is shown in Table C.11.

Table C.11. Breckenridge—Property Values in Wildfire Threat Zones

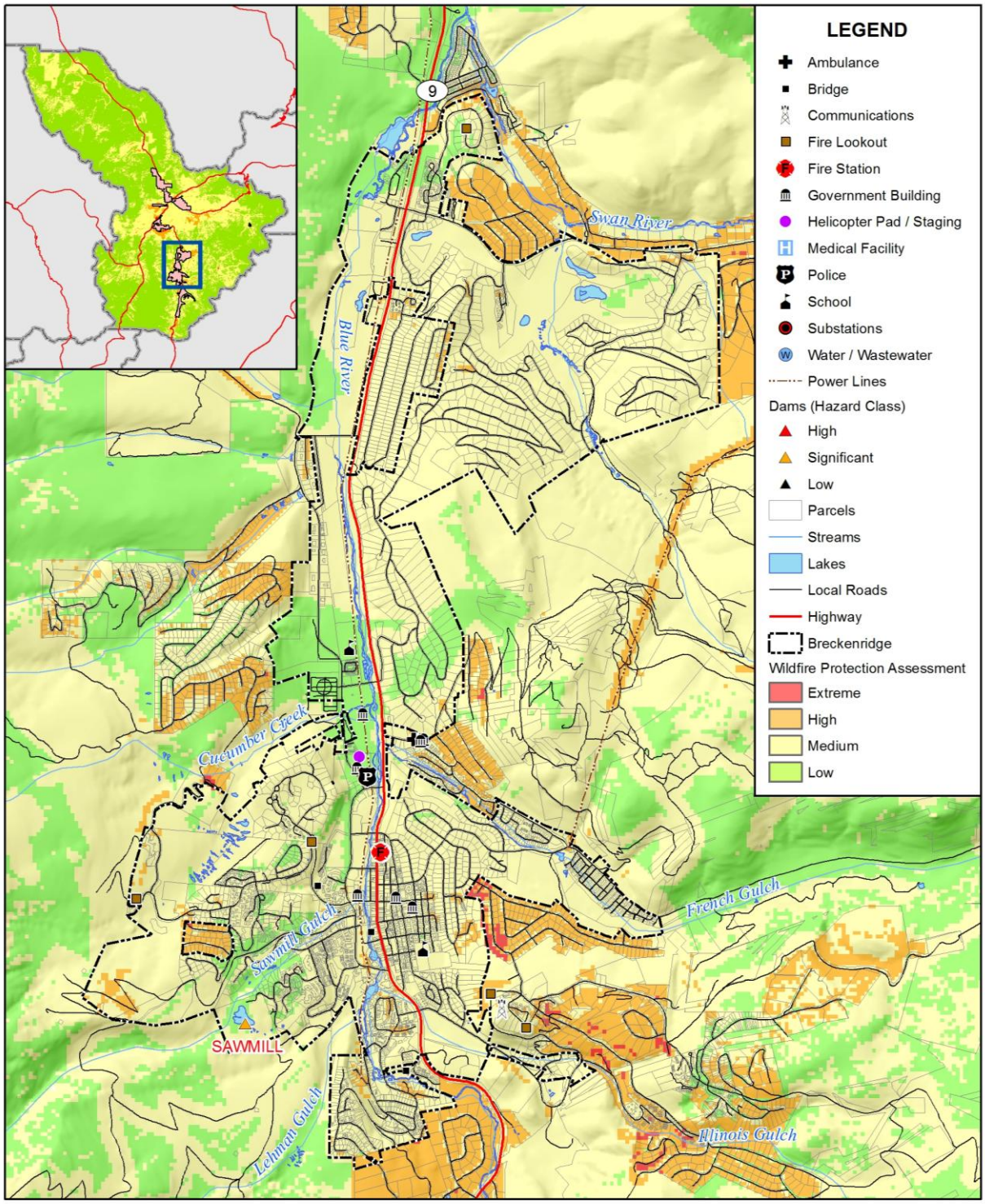
Threat Zone	Land Use	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Low	Commercial	1	$490,854	$1,150,167	$1,150,167	$2,300,334
	Residential	264	$106,186,624	$183,636,405	$91,818,203	$275,454,608
	Total	**265**	**$106,677,478**	**$184,786,572**	**$92,968,370**	**$277,754,942**
Medium	Commercial	131	$98,577,079	$111,950,084	$111,950,084	$223,900,168
	Government	1	$0	$632,820	$632,820	$1,265,640
	Industrial	6	$979,583	$7,447,916	$11,171,874	$18,619,790
	Mixed Use	42	$10,752,967	$237,862,821	$237,862,821	$475,725,642
	Other	10	$6,179,631	$119,433,986	$119,433,986	$238,867,972
	Residential	2,149	$665,500,771	$2,637,310,133	$1,318,655,067	$3,955,965,200
	Total	**2,339**	**$781,990,031**	**$3,114,637,760**	**$1,799,706,652**	**$4,914,344,412**
High	Mixed Use	2	$0	$31,001,823	$31,001,823	$62,003,646
	Residential	63	$18,699,990	$60,101,284	$30,050,642	$90,151,926
	Total	**65**	**$18,699,990**	**$91,103,107**	**$61,052,465**	**$152,155,572**
Extreme	Residential	2	$455,228	$491,875	$245,938	$737,813
	Total	**2**	**$455,228**	**$491,875**	**$245,938**	**$737,813**
Grand Total		**2,671**	**$907,822,727**	**$3,391,019,314**	**$1,953,973,424**	**$5,344,992,738**

Source: AMEC analysis with County data

No critical facilities were identified in either extreme or high wildfire zones in Breckenridge. Two thousand nine hundred and thirty (2,930) buildings are located in Breckenridge's wildfire hazard areas, based on footprint count. This includes 3 buildings in extreme wildfire threat zones, 127 in high threat zones, 2,615 in medium threat zones, and 185 in low threat zones. There is one critical facility, a helicopter pad/staging area, in a high wildfire threat zone in Breckenridge. Areas or subdivisions of particular concern are the following:

- Boulder Ridge
- Breckenridge South
- Christie Heights
- Corkscrew Flats
- Goldflake
- Highlands
- Iowa Hill
- Kenington Place
- Shock Hill
- Sunbeam Estates
- Vista Point
- Warriors Mark
- Wellington Neighborhood

Figure C.4. Wildfire Threat and Critical Facilities in Breckenridge



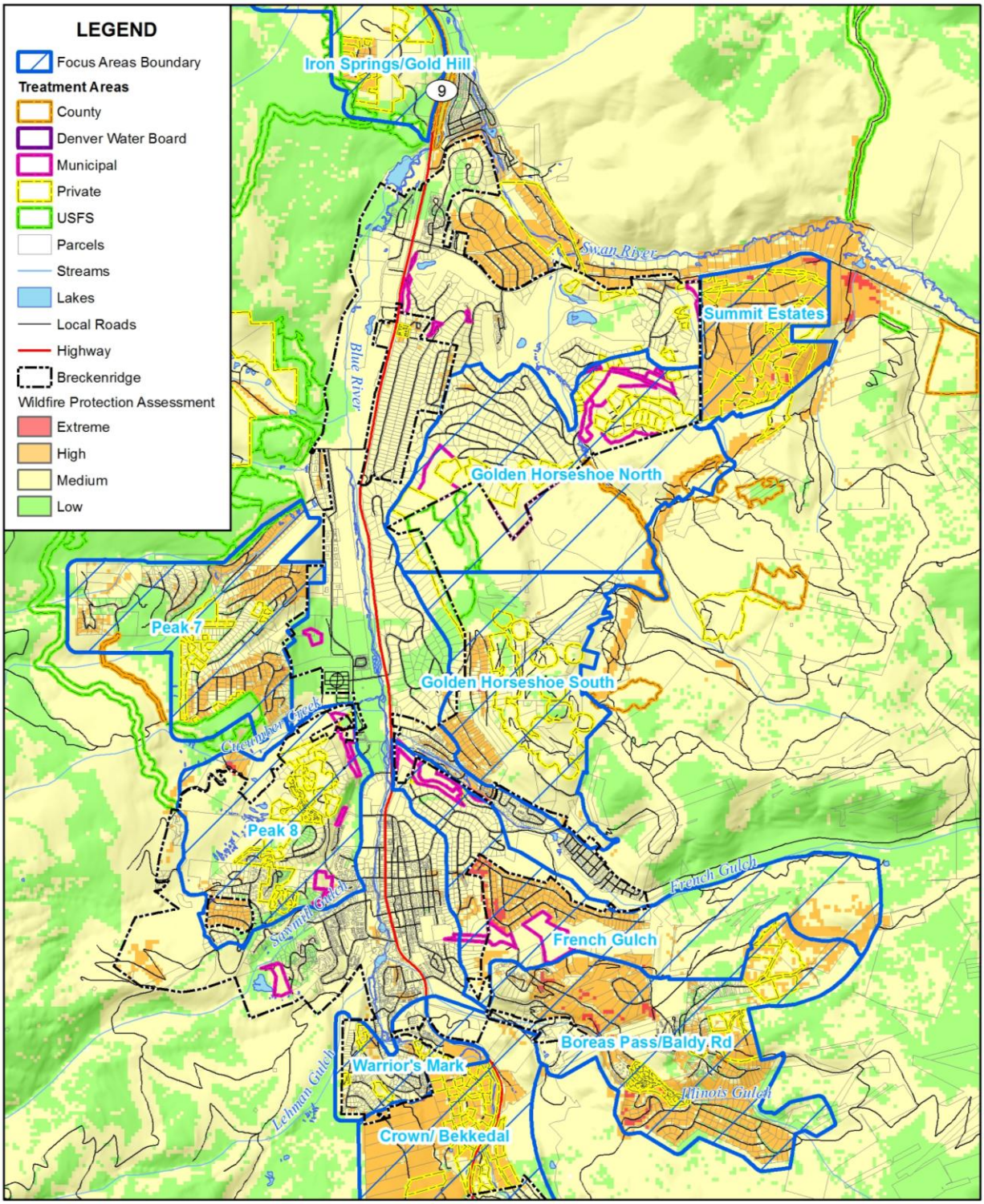
amec

0 1 2 Miles

N

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

Figure C.5. Wildfire Focus Areas and Treatment Areas in Breckenridge



amec

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County

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.

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 limbing dead branches up to 10 feet off the ground and removing woody litter off the forest floor.

Growth and Development Trends

Table C.12 illustrates how Breckenridge has grown in terms of population and number of housing units between 2000 and 2011.

Table C.12. Breckenridge—Change in Population and Housing Units, 2000-2011

2000 Population	2011 Population Estimate	Estimated Percent Change 2000-2011	2000 # of Housing Units	2011 Estimated # of Housing Units	Estimated Percent Change 2000-2011
2,408	4,351	+80.7	4,270	6,765	+58.4

Source: ACS 2011 and US Census 2000, factfinder2.census.gov

Part of the growth in recent years can be attributed to the annexation of the Warrior's Mark area in 2002.

The Town's comprehensive plan estimates that the maximum build-out of housing units (7,514 excluding lodging and 7 accessory units) will eventually cap the maximum permanent population for the Town, assuming the current policy of approving no new density remains. Based on this build-out, the Town's permanent population is projected to top out at approximately 5,681. Based on a medium growth rate of 6 percent, the Town should reach the maximum permanent population sometime in 2015. Even with the low growth rate projections (4 percent), the Town could expect to reach maximum population no later than sometime in 2020. As of the writing of the 2008 comprehensive plan, the Town estimated that maximum population could be reached as soon as sometime in 2011 with a high growth rate (8 percent), but evidently this did not occur. Regardless of which growth rate proves to be most accurate, in all likelihood, the Town can expect to reach maximum unit and population figures in the near future.

There is new development planned on the recently annexed Stan Miller property (155 units), at the base of Peak 7, 8, and 9 (mostly condominium and hotel units, 450-500 units, depending on size, mostly will be short-term rentals and time shares), some more units planned at Wellington Neighborhood Phase II (160 units, some already finished or under construction), about 45 units at Valley Brook (north of police and new childcare center), 250-300 units planned for Block 11 Airport (the old runway), and at Pinewood Village Phase 2 (30-40 units). The Town is also planning for the build-out of the skier parking lots in town (about 30 residential units and about 130 condominium and hotel units with about 35,000 square feet of commercial/skier services).

As far as new facilities, the Town is working on a new design for the Breckenridge Nordic Center located on Ski Hill Road, which also may double as a nature center.

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.

Regulatory Mitigation Capabilities

Table C.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 Breckenridge.

Table C.13. 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	
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	
Capital Improvements Plan	Yes	
Economic Development Plan	No	

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
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, 2011
Elevation certificates on file	Yes	
Other	Yes	Capacity Analysis for the Upper Blue Valley

Town of Breckenridge Master Plan, 2008

The Breckenridge Master Plan guides the future development of the town. The purpose of the Master 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. In 2004, the Town initiated the planning process for improvements to Main Street. As part of these improvements, drainage will be evaluated and appropriate measures included with construction.

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.

Administrative/Technical Mitigation Capabilities

Table C.14 identifies the personnel responsible for activities related to mitigation and loss prevention in Breckenridge.

Table C.14. 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	
Planner/Engineer/Scientist with an Understanding of Natural Hazards	No		
Personnel Skilled in GIS	Yes	Engineering	
Full Time Building Official	Yes		
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

Fiscal Mitigation Capabilities

Table C.15 identifies financial tools or resources that Breckenridge could potentially use to help fund mitigation activities.

Table C.15. 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	Town currently has two: golf course expansion and the indoor ice arena
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.

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.

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.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.

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:

- Working with FEMA and the Colorado Water Conservation Board in the review and adoption of new digital flood insurance rate maps (DFIRMs) as part of the map modernization program
- Reviewing the flood damage prevention ordinance and identifying opportunities to strengthen requirements and enforcement when adopting new DFIRMs
- Considering 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
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:	2009-2013
Status:	Ongoing. Culverts are inspected annually.

Mitigation Action: Breckenridge—2 Erosion Traps

Jurisdiction:	Town of Breckenridge
Action Title:	Install erosion traps
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:	2009-2013
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
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:	2009-2013
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

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: Complete

Mitigation Action: Breckenridge—5 Evacuation Planning

Jurisdiction:	Town of Breckenridge
Action Title:	Update and enhance evacuation plan
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:	Complete

Mitigation Action: Breckenridge—6 Hazardous Materials Mapping and Planning

Jurisdiction:	Town of Breckenridge
Action Title:	Inventory and map locations of hazardous materials
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:	2009-2013
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
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:	2009-2013
Status:	Ongoing

Mitigation Action: Breckenridge—8 Emergency Generators

Jurisdiction:	Town of Breckenridge
Action Title:	Emergency generator power connections at pump stations
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:	Proposed for 2014
Status:	New in 2013

Mitigation Action: Breckenridge—9 Watershed Protection Plan

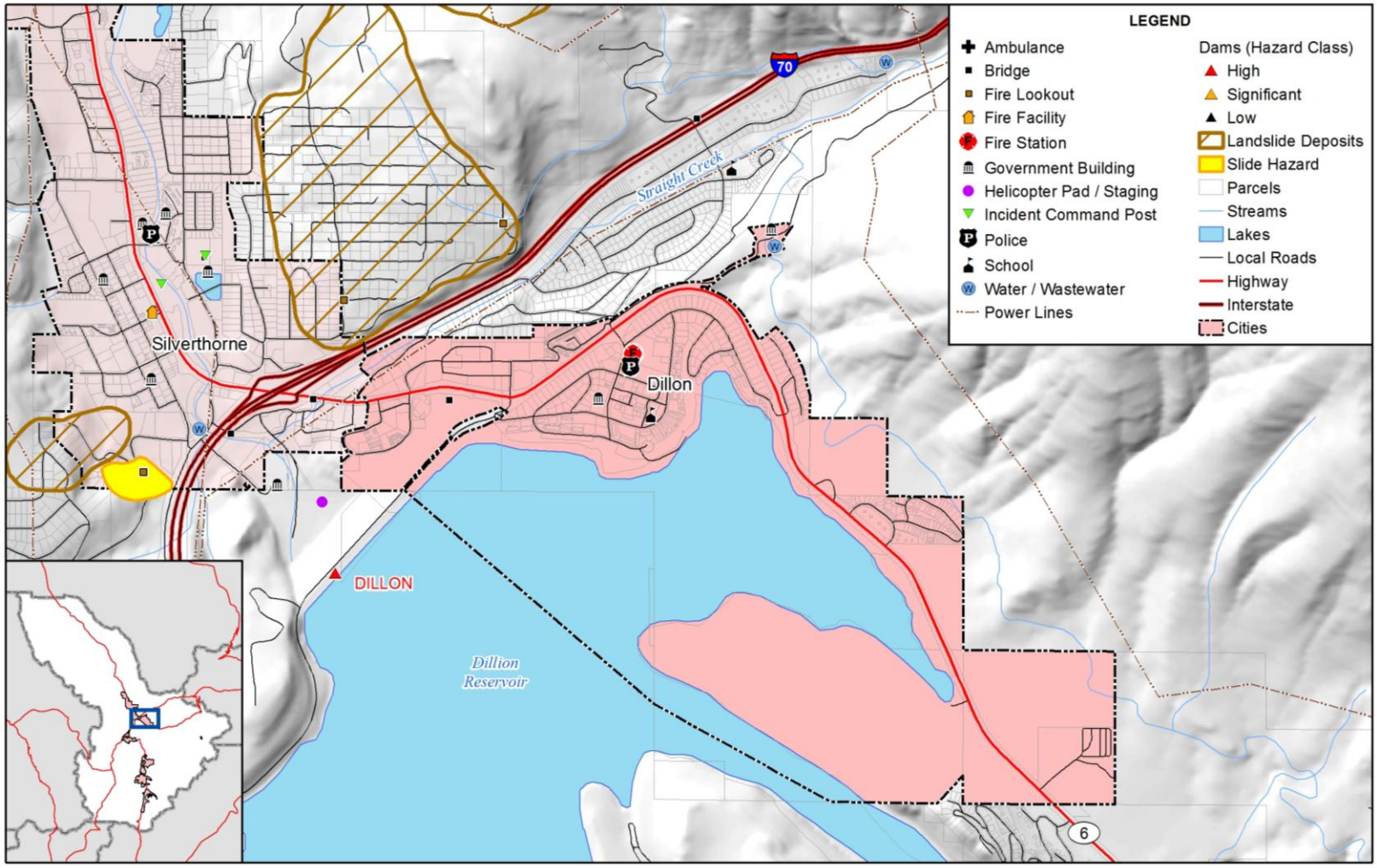
Jurisdiction:	Town of Breckenridge
Action Title:	Watershed Protection Plan
Priority:	High
Issue/Background:	The Town of Breckenridge produced a Forest Health Plan with proposed fuels treatments for the Breckenridge area. During the planning for that effort in conjunction with the pine beetle epidemic, 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 is taking this background information to produce a Watershed Protection Plan. This preplanning effort is intended to address immediate remediation efforts post fire as necessary and assist the BAER team after a burn.
Ideas for Implementation:	Tetra Tech is currently exploring the best options to reduce sediment and debris run off post fire. Revegetation, strategically located sediment basins and rock debris basins are potential options at this stage in the draft plan.
Responsible Agency:	Julia Puester, Planner II
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. May look for additional funding for implementation.
Cost Estimate:	$38,000 for consultant (Peggy Bailey, Tetra Tech) /plan preparation
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 efforts by giving the Town the ability to act quickly before a heavy rain event post fire.
Timeline:	The plan is expected to be completed in July 2013. Implementation is not expected until post fire.
Status:	New in 2013

ANNEX D: TOWN OF DILLON

D.1 Community Profile

Figure D.1 shows a map of the Town of Dillon and its location within Summit County. The map also shows critical facilities and landslide deposits.

Figure D.1. Map of Dillon



amec

Map compiled 5/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1,
Colton/USGS Earth Data Analysis Center

0 0.5 1 Miles

N

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.

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.

Population

The estimated 2011 population of the Town of Dillon was 626. The 2010 Census recorded the population at 904. Select American Community Survey (ACS) 2011 and 2010 US Census demographic and social characteristics for Dillon are shown in Table D.1.

Table D.1. Dillon—Demographic and Social Characteristics

Characteristic	2010	2011
Gender/Age		
Male (%)	51.9	50.6
Female (%)	48.1	49.4
Under 5 Years (%)	5.3	10.1
65 Years and Over (%)	15.3	13.2
Race/Ethnicity (one race)		
White (%)	89.2	93.6
Black or African American (%)	0.3	0.0
American Indian and Alaska Native (%)	0.8	0.0
Asian	2.2	1.3
Other	6.1	5.1
Hispanic or Latino (Of Any Race) (%)	10.8	13.4
Other		
Average Household Size	1.99	2.15
High School Graduate or Higher (%)	95.4	95.4

Source: ACS 2011, 2010 US Census, factfinder2.census.gov

Economy

According to the 2011 ACS estimates, the industries that employed the highest percentages of Dillon's labor force were arts, entertainment, recreation, accommodation, and food services (23.6%); educational, health, and social services (20.5%); construction (13.4%); finance, insurance, real estate, and rental and leasing (14.4%); and retail trade (12.6%). Select economic characteristics for Dillon from the 2011 ACS estimates and 2010 US Census are shown in Table D.2.

Table D.2. Dillon—Economic Characteristics

Characteristic	2010	2011
Families below Poverty Level	3.8%	4.6%
Individuals below Poverty Level	6.8%	6.9%
Median Home Value	$435,400	$445,500
Median Household Income	$76,042	$78,657
Per Capita Income	$51,216	$49,238
Population in Labor Force*	544	519

Source: ACS 2011, 2010 US Census, factfinder2.census.gov
*Age 16 years and over

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.3). In the context of the countywide planning area, there are no hazards that are unique to Dillon.

Table D.3. Dillon—Hazard Summary

Hazard Type	Geographic Extent*	Probability*	Magnitude*	Hazard Rating
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Failure	Small	Unlikely	Limited	Low
Drought	Large	Likely	Limited	Low
Earthquake	Large	Unlikely	Limited	Low
Erosion/Deposition	Medium	Likely	Limited	Moderate
Flood	Isolated	Unlikely	Limited	Low
Hailstorm	Large	Likely	Limited	Moderate
Hazardous Materials Release (Transportation)	Isolated	Occasional	Critical	High
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Unlikely	Critical	Low
Lightning	Large	Likely	Critical	Moderate
Mountain Pine Beetle Infestation	Small	Highly Likely	Limited	Moderate
Tornado	Isolated	Unlikely	Critical	Low
Severe Winter Weather	Large	Likely	Critical	High

Hazard Type	Geographic Extent*	Probability*	Magnitude*	Hazard Rating
Wildfire	Small	Occasional	Critical	Moderate
Windstorm	Large	Likely	Limited	Moderate

*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 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 as a whole, which has already been assessed in Section 3.3 Vulnerability Assessment in the main plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of moderate or high significance that may vary from other parts of the planning area. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment in the main plan.

Community Asset Inventory

Table D.4 shows the total population, number of structures, land value, and assessed value of improvements to parcels in Dillon. Land values have been purposely excluded from the Total Value because land remains following disasters, and subsequent market devaluations are frequently short-term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

Table D.4. Dillon—Maximum Population and Building Exposure

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Land Value	Estimated Content Value	Total Value*
Commercial	145	123	$36,261,400	$57,391,173	$57,391,173	$114,782,346
Government	49	24	$6,115,290	$27,628,750	$27,628,750	$55,257,500
Mixed Use	1	1	$213,172	$672,406	$672,406	$1,344,812
Open Space	11	0	$25,121	$0	$0	$0
Other	1	0	$0	$0	$0	$0
Residential	366	312	$59,466,369	$344,384,136	$172,192,068	$516,576,204
Total	**573**	**460**	**$102,081,352**	**$430,076,465**	**$257,884,397**	**$687,960,862**

Source: Summit County Assessor 2013
*Content Value estimated

Table D.5 lists critical facilities and other community assets identified by Dillon's planning team as important to protect in the event of a disaster.

Table D.5. Dillon—Critical Facilities and Other Community Assets

Name of Asset	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Information
MGD Water Treatment Plant	4,750,000	5/1.5 mgd	Vulnerability assessment completed
Gold Run Sewage Lift Station	1,000,000	0	
Elevated Water Storage Tank	500,000	400,000 gallon	400,000 Gal.
Buried Water Storage Tank	750,000	500,000 gallon	500,000 Gal.
Public Works Maintenance Building	500,000	15	
Town Hall/Police Department	2,500,000	103	
Dillon Valley Emergency Water Interconnect	150,000	0	Emergency connect to Dillon Valley
Silverthorne Emergency Water Interconnect	200,000	0	Emergency connect to Silverthorne
Straight Creek Water Diversion	150,000	0	Supply for Dillon and Dillon Valley
Old Dillon Reservoir	4,770,000	0	Dillon, Silverthorne, Summit County
Lake Dillon Fire District Station 8	n/a	n/a	
Lake Dillon Preschool	n/a	n/a	
Dillon Reservoir/Denver Water	n/a	n/a	
Porcupine Peak Site (prehistoric site)	n/a		National Register of Historic Places

Sources: Town of Dillon; Directory of Colorado State Register Properties, www.coloradohistory-oahp.org/programareas/register/1503/; National Register Information System, www.nr.nps.gov/

The locations of critical facilities in Dillon identified by Summit County GIS are illustrated in Figure D.2 DFIRM and Critical Facilities in Dillon.

For municipal water, Dillon shares the Old Dillon Reservoir with Silverthorne and Summit County, which greatly reduces the community's vulnerability to drought.

Vulnerability by Hazard

This section analyzes existing and future structures and other assets at risk to hazards ranked of moderate or high significance that vary from the risks facing the entire planning area and estimates potential losses. This only includes wildfire. Flood is also analyzed below despite the low risk in Dillon because of readily available data.

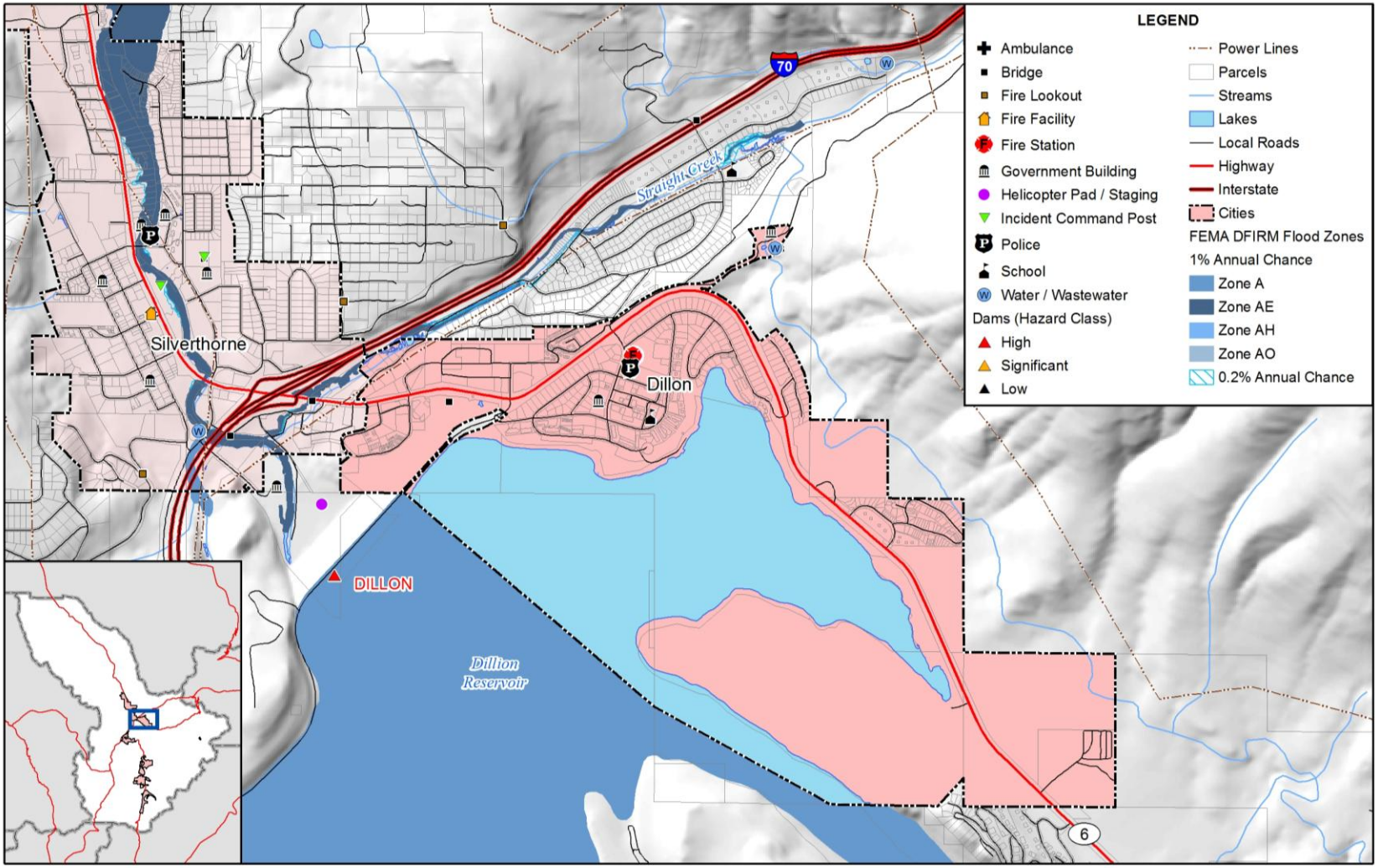
Flood

Existing Development

The Town of Dillon does not have any Special Flood Hazard Areas identified in the DFIRM. Therefore, the Town has no critical facilities at risk to flooding. Figure D.2 depicts the location of Dillon's critical facilities.

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.

Figure D.2. DFIRM and Critical Facilities in Dillon*



amec

0 0.5 1 Miles

N

Map compiled 5/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, Preliminary DFIRM

*The Town of Dillon has no special flood hazard areas.

National Flood Insurance Program

The Town of Dillon has not been mapped by FEMA and is not a participant in the National Flood Insurance Program. There are no repetitive loss properties.

Future Development

Based on existing floodplains and growth patterns, future development in flood hazard areas is unlikely to occur in Dillon. Although the Town does not have a floodplain ordinance in place, it addresses development in flood prone areas in its subdivision regulations. 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.

Landslide, Mud Flow/Debris Flow, Rock Fall

Existing Development

Potential losses for landslide areas were estimated using Summit County GIS and assessor's data and were examined in terms of values and critical facilities at risk. Additional landslide hazard analysis was completed using the more comprehensive USGS landslide deposits layer during the 2013 update. No parcels or building footprints were identified in landslide deposit areas in Dillon.

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. Dillon does not currently have any landslide hazard areas within the Town's boundaries, but this issue should be considered during future annexation and development.

Wildfire

Existing Development

A wildfire threat ranking was developed for the Summit County Community Wildfire Protection Plan by the County, fire protection districts, and U.S. Forest Service. It is based on fuel hazards, risk of wildfire occurrence, essential infrastructure at risk, community values at risk, and local preparedness and firefighting capability and classifies the wildfire threat as low, medium, high, and extreme. The wildfire threat GIS layer, updated in 2011, was used to determine the number of acres in each wildfire threat zone and map the wildfire threat in Dillon (see Table D.6 and

Figure D.3). Figure D.4 shows the wildfire focus areas from the County CWPP and treatment areas in Dillon.

Table D.6. Dillon—Acreage in Wildfire Threat Zones

Low		Medium		High		Extreme		
Acres	%Total	Acres	%Total	Acres	%Total	Acres	%Total	Total Acres
102	7%	1,374	93%	7	0.5%	-	-	1,482

Source: AMEC analysis with County data

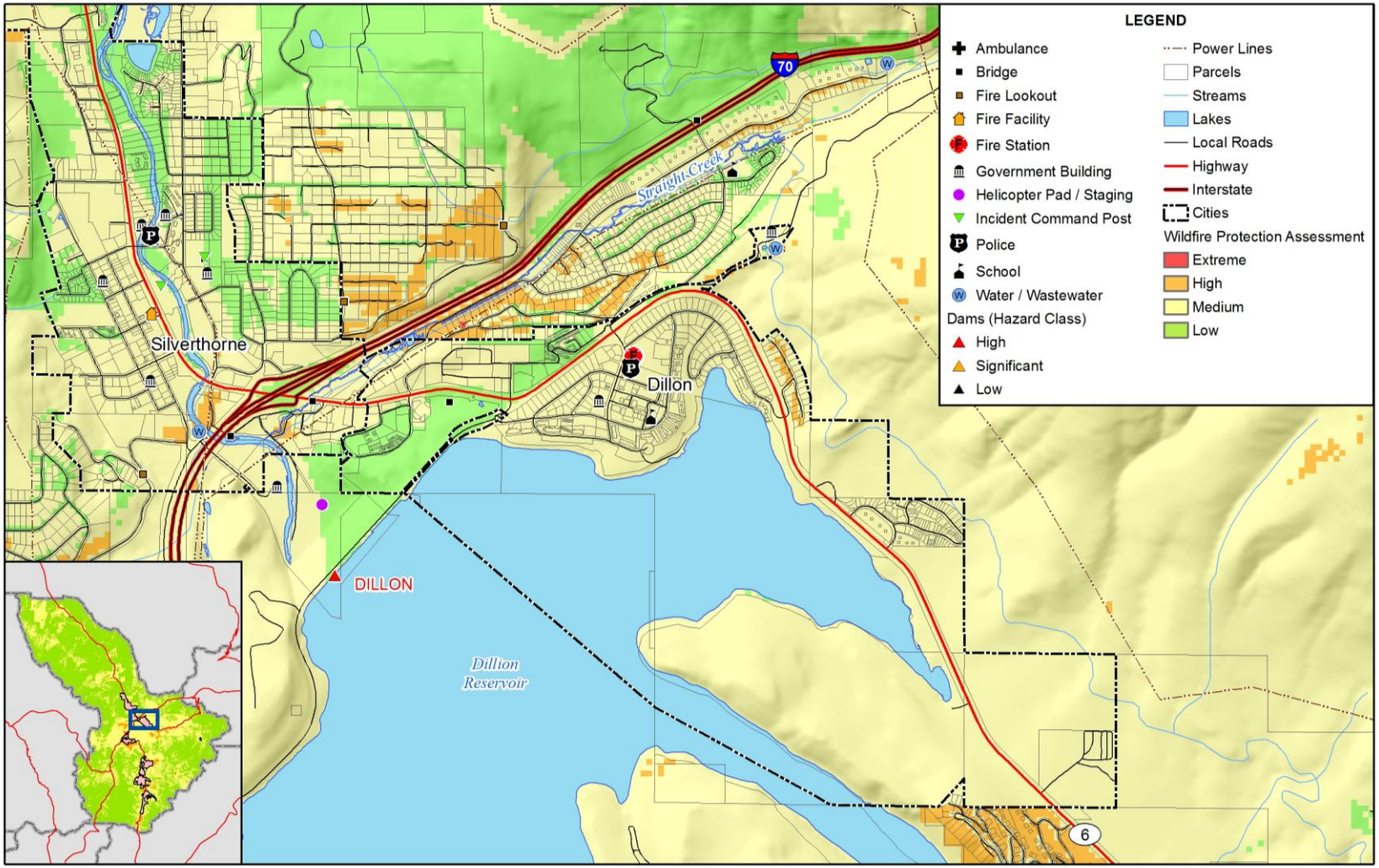
Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard, the property values in Dillon were separated into wildfire threat zones. The breakdown of property values in Dillon by wildfire threat zone is shown in Table D.7.

Table D.7. Dillon—Property Values in Wildfire Threat Zones

Threat Zone	Land Use	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Low	Commercial	74	$8,300,890	$22,683,531	$22,683,531	$45,367,062
	Residential	37	$4,400,157	$11,337,272	$5,668,636	$17,005,908
	Total	**111**	**$12,701,047**	**$34,020,803**	**$28,352,167**	**$62,372,970**
Medium	Commercial	49	$25,409,905	$34,707,642	$34,707,642	$69,415,284
	Government	24	$6,067,794	$27,628,750	$27,628,750	$55,257,500
	Mixed Use	1	$213,172	$672,406	$672,406	$1,344,812
	Residential	269	$52,231,623	$331,236,603	$165,618,302	$496,854,905
	Total	**343**	**$83,922,494**	**$394,245,401**	**$228,627,100**	**$622,872,501**
High	Residential	6	$1,203,289	$1,810,261	$905,131	$2,715,392
	Total	**6**	**$1,203,289**	**$1,810,261**	**$905,131**	**$2,715,392**
Grand Total		**460**	**$97,826,830**	**$430,076,465**	**$257,884,397**	**$687,960,862**

Source: AMEC analysis with County data

Figure D.3. Wildfire Threat and Critical Facilities in Dillon



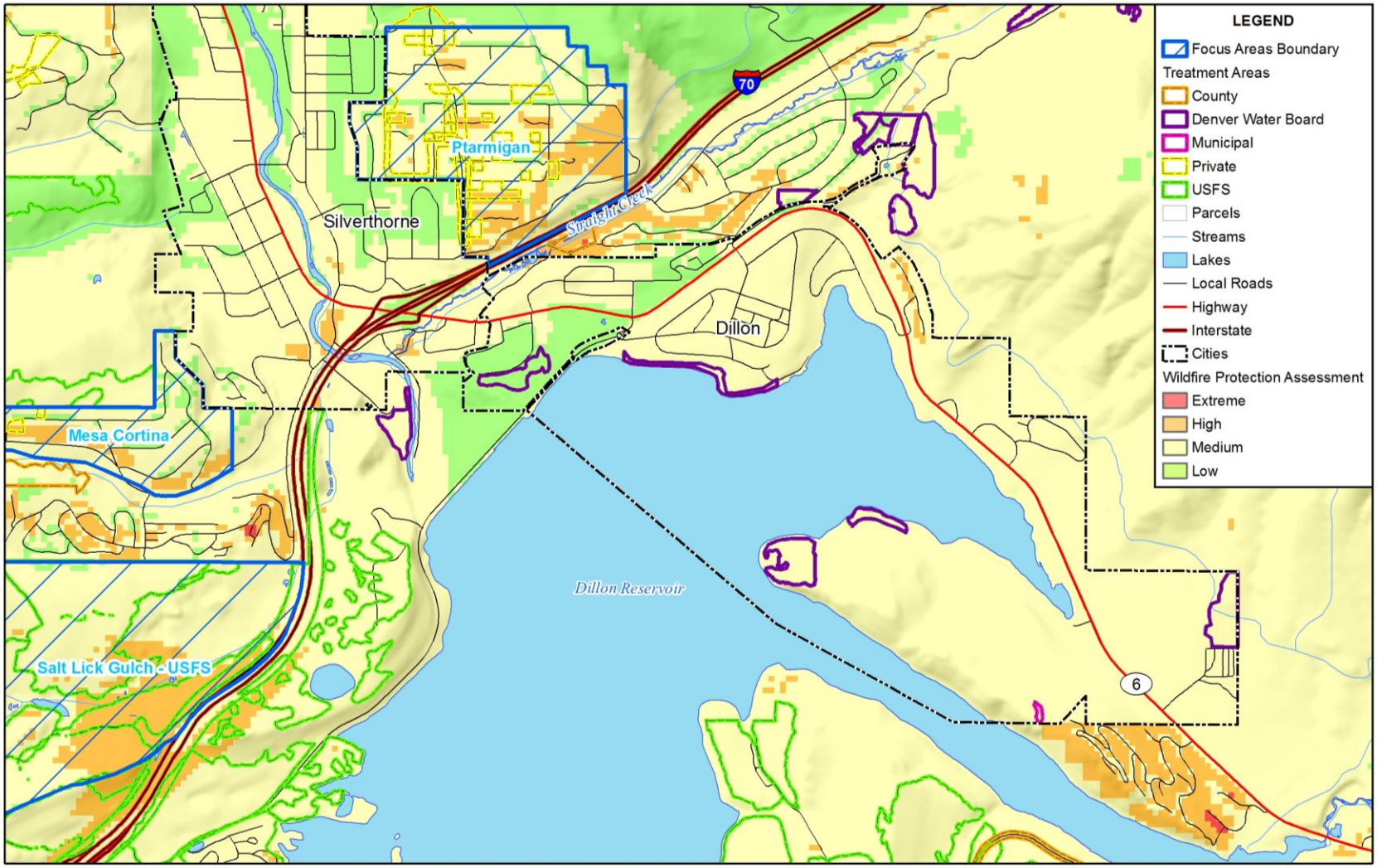
amec

Map compiled 5/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

0 0.5 1 Miles

N

Figure D.3. Wildfire Focus Areas and Treatment Areas in Dillon



amec

0 0.7 1.4 Miles

N

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County

The Dillon Treatment Plant is located in the high fire threat zone. Four hundred and eighty (480) buildings are located in Dillon's wildfire hazard areas, based on footprint count. This includes 17 buildings in high wildfire threat zones, 419 in medium threat zones, and 44 in low threat zones. 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 amount 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 Lake Dillon Fire Protection District, 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.

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.

Growth and Development Trends

Table D.8 illustrates how Dillon has grown in terms of population and number of housing units between 2000 and 2011.

Table D.8. Dillon—Change in Population and Housing Units, 2000-2011

2000 Population	2011 Population Estimate	Estimated Percent Change 2000-2011	2000 # of Housing Units	2011 Estimated # of Housing Units	Estimated Percent Change 2000-2011
802	626	-21.9	1,280	1,723	+34.6

Source: ACS 2011, factfinder2.census.gov

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.

Regulatory Mitigation Capabilities

Table D.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 Dillon.

Table D.9. Dillon—Regulatory Mitigation Capabilities

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
Master Plan	Yes	Reviewed/revised 2013
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
Growth Management Ordinance	No	
Floodplain Ordinance	No	
Other Special Purpose Ordinance (Stormwater, Steep Slope, Wildfire)	Yes	
Building Code	Yes	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	
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, 2011
Elevation Certificates	No	

Dillon Comprehensive Plan, 2013

The purpose of the Dillon Comprehensive Plan is to provide a framework for decision making regarding future development that is in the best long-term 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

- Policy: 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.
- Policy: Limit development on slopes greater than 20 percent and require engineering investigations of sites over 20 percent during project review. Development on slopes in excess of 20 percent 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.
- Policy: 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.

- **Goal:** To preserve and foster the unique natural, physical, and man-made characteristics and cultural aspects of Dillon
  - Policy: 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.
  - Policy: Improve the Town's landscaping regulations including the adoption of regulations that would reduce the amount of water utilized for the maintenance of landscaping.
  - Policy: Continue to enact watering restrictions in times of drought and encourage voluntary water reduction at all times.
  - Policy: Provide guidance to the community in selection of drought resistant xeriscape plant species.
  - Policy: Work with Denver Water Board to preserve the areas near the lake to reduce erosion.
  - Policy: Monitor areas of high mortality due to pine beetle infestation and take steps to mitigate erosion following tree removal.

- **Goal:** To provide a water distribution and treatment system that meets the future needs of the community.
  - Policy: Continue to strive toward conservation of the community's water resources through policies in Town development ordinances.
  - Policy: 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.

- **Goal**: To cooperate with Lake Dillon Fire Rescue to provide 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.
  - Policy: Continue to work with the Joint Fire Authority to provide for the community's fire protection needs.
  - Policy: 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.
  - Policy: Evaluate existing development ordinances to insure they provide adequate measures for fire protection, and modify them if necessary.

- **Goal:** The Town should continue to cooperate in wildfire preparation with other jurisdictions.
  - Policy: Continue participation in the County Wildfire Council.
  - Policy: Assist homeowners in creating defensible space around homes.
  - Policy: Continue to remove and replace beetle kill trees throughout the Town.

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.

Administrative/Technical Mitigation Capabilities

Table D.10 identifies the personnel responsible for activities related to mitigation and loss prevention in Dillon.

Table D.10. 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

Fiscal Mitigation Capabilities

Table D.11 identifies financial tools or resources that Dillon could potentially use to help fund mitigation activities.

Table D.11. 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	

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.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
Priority:	Low
Issue/Background:	A local Hazard Mitigation Planning Committee is needed to provide input to this plan and to guide policy and implementation.
Ideas for Implementation:	Town department heads meet on a weekly basis. Department heads from all the jurisdictions meet on a monthly basis. Part of the staff reviews that are currently conducted are to discuss any hazards that have been identified and then bring the appropriate parties together to discuss the corrective course of action. One individual from each of the affected agencies would then work and develop an action plan. Identify one individual from each agency that would act as the representative of the Hazard Mitigation Planning Committee, meeting on a monthly basis with the other representatives to bring forward concerns and ideas on specific areas.
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 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 2013. The committee is composed of Town department heads who meet regularly to discuss issues and develop mitigation policies. The group continues to look at issues concerning HAZMAT safety, dam security, wildfire awareness and preparation, watershed protection, drought planning, and emergency planning.

Mitigation Action: Dillon—2 Public Involvement

Jurisdiction: Town of Dillon

Action Title: Improve education on risk and preparedness and mitigation measures

Priority: Low

Issue/Background: There is a need for continued and improved education on risk and preparedness and mitigation measures so that residents can take action to reduce their risk.

Ideas for Implementation: The Summit Office of Emergency Management in coordination with the Towns will prepare and conduct a series of presentations focused upon coordination and improvement of mitigation activities.

The initial phases of this work will be in coordinating local adoption of the Town's annex. The next step will be using 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, water conservation, and wildfire are priority hazards that the materials will address.

The Town of Dillon will coordinate with Summit County and other towns in these efforts and distribute materials within Dillon as appropriate.

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)

- Implements mitigation plan
- Improves communication and coordination
- Increases public education and awareness

Timeline: Ongoing

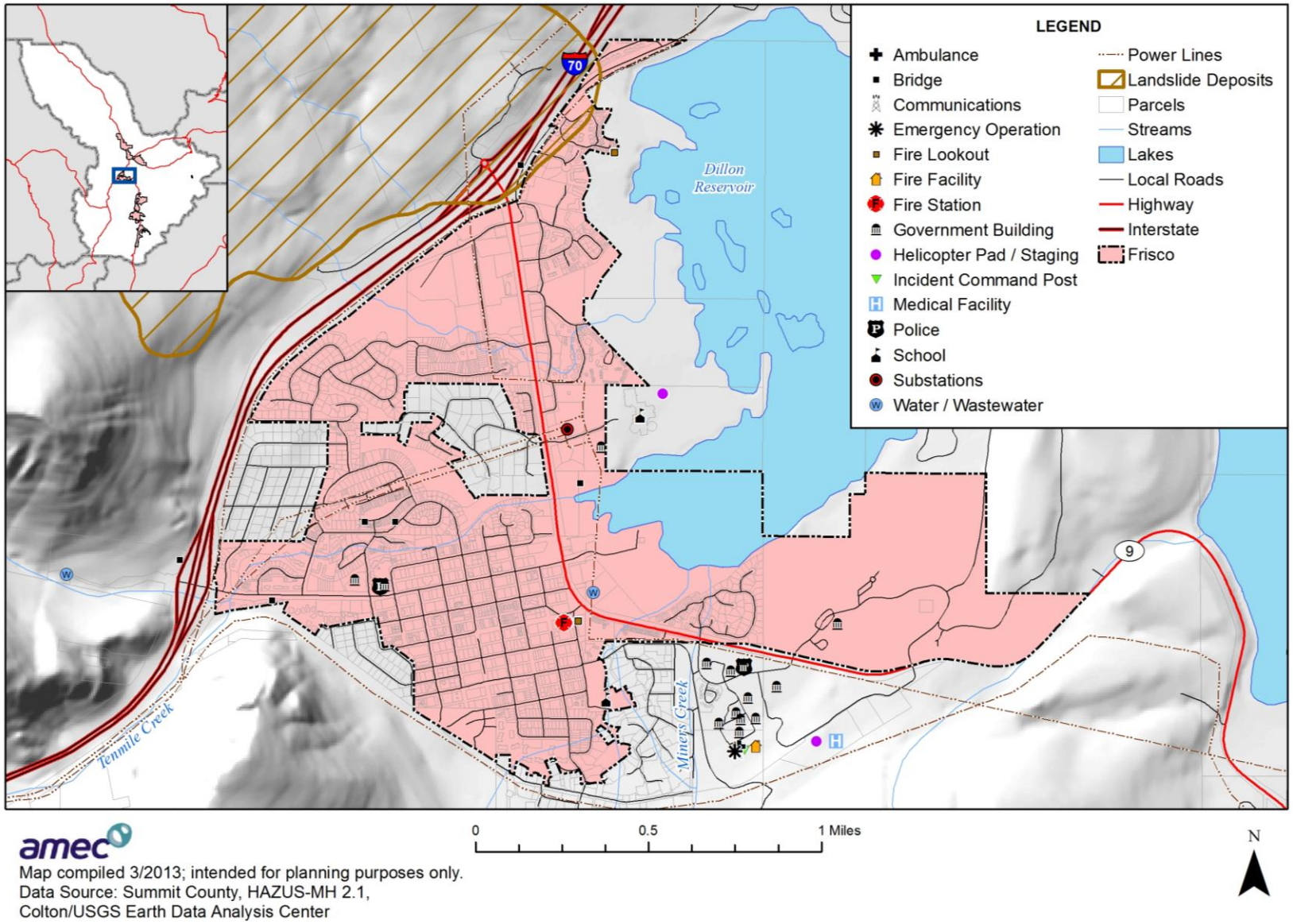
Status: Ongoing as of 2013. The outreach program is initiated by the use of pamphlets, public service announcements, and educational material in monthly water and sewer billings.

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. The map also shows critical facilities and landslide deposits.

Figure E.1 Map of Frisco



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.

Population

The estimated 2011 population of the Town of Frisco was 2,661. The 2010 US Census recorded the population at 2,683. Select American Community Survey (ACS) 2011 estimates and 2010 US Census demographic and social characteristics for Frisco are shown in Table E.1

Table E.1. Frisco—Demographic and Social Characteristics

Characteristic	2010	2011
Gender/Age		
Male (%)	55.9	57.0
Female (%)	44.1	43.0
Under 5 Years (%)	3.8	4.0
65 Years and Over (%)	11.7	8.1
Race/Ethnicity (one race)		
White (%)	94.2	94.1
Black or African American (%)	0.4	0.0
American Indian and Alaska Native	0.3	0.0
Asian (%)	1.3	1.1
Other (%)	2.2	4.8
Hispanic or Latino (Of Any Race) (%)	5.2	6.0
Other		
Average Household Size	2.07	2.34
High School Graduate or Higher (%)	93.9	93.7

Source: ACS 2011, 2010 US Census, factfinder2.census.gov

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.

Economy

According to 2011 ACS estimates, the industries that employed the highest percentages of Frisco's labor force were arts, entertainment, recreation, accommodation, and food services (23.7%); professional, scientific, and management, and administrative and waste management services (20.1%); construction (11.5%); educational services, and health care and social assistance (8.9%); retail trade (8.6%); and finance, insurance, real estate, and rental and leasing (8.5%). Select economic characteristics for Frisco from the 2011 ACS estimates and 2010 US Census are shown in Table E.2.

Table E.2. Frisco—Economic Characteristics

Characteristic	2010	2011
Families below Poverty Level	7.6%	10.5%
Individuals below Poverty Level	3.9%	8.5%
Median Home Value	$495,700	$485,500
Median Household Income	$80,102	$73,644
Per Capita Income	$38,822	$38,436
Population in Labor Force*	2,305	2,316

Source: ACS 2011, 2010 US Census, factfinder2.census.gov
*Age 16 years and over

E.2 Hazard Identification and Profiles

Frisco'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 E.3). In the context of the countywide planning area, there are no hazards that are unique to Frisco.

Table E.3. Frisco—Hazard Summary

Hazard Type	Geographic Extent*	Probability*	Magnitude*	Hazard Rating
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Failure	Isolated	Unlikely	Limited	Low
Drought	Large	Likely	Limited	Moderate
Earthquake	Large	Unlikely	Limited	Low
Erosion/Deposition	Medium	Likely	Limited	Moderate
Flood	Isolated	Likely	Limited	Moderate
Hazardous Materials Release (Transportation)	Isolated	Occasional	Critical	High
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Unlikely	Limited	Low
Lightning	Large	Likely	Critical	Moderate
Mountain Pine Beetle Infestation	Small	Highly Likely	Limited	High
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Small	Occasional	Critical	High

Hazard Type	Geographic Extent*	Probability*	Magnitude*	Hazard Rating
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 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 in the main plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of moderate or high significance that may vary from other parts of the planning area. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment in the main plan.

Community Asset Inventory

Table E.4 shows the total population, number of structures, land value, and assessed value of improvements to parcels in Frisco. Land values have been purposely excluded from the Total Value because land remains following disasters, and subsequent market devaluations are frequently short-term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

Table E.4. Frisco—Building Exposure

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value*	Total Value**
Commercial	63	47	$40,189,003	$59,239,547	$59,239,547	$118,479,094
Government	11	2	$247,638	$29,747	$29,747	$59,494
Mixed Use	55	47	$26,242,711	$77,927,905	$77,927,905	$155,855,810
Open Space	23	0	$44,149	$0	$0	$0
Other	3	0	$0	$0	$0	$0
Residential	1,657	1,467	$294,560,896	$909,368,332	$454,684,166	$1,364,052,498
Total	**1,812**	**1,563**	**$361,284,397**	**$1,046,565,531**	**$591,881,365**	**$1,638,446,896**

Source: Summit County Assessor 2013
*Content Value estimated, **Includes content and improvements only

Table E.5 lists critical facilities and other community assets identified by Frisco as important to protect in the event of a disaster.

Table E.5. Frisco—Critical Facilities and Other Community Assets

Name of Asset	Replacement Value ($)
Police Station	550,000
Summit County Preschool	300,000
Frisco Elementary School	150,000
Lake Dillon Fire Station	500,000
Frisco Sanitation	-
Summit Stage Transfer Building	100,000

Source: Town of Frisco

The locations of critical facilities in Frisco identified by Summit County GIS are illustrated in Figure E.2 DFIRM and Critical Facilities in Frisco.

Vulnerability by Hazard

This section analyzes existing and future structures and other assets at risk to hazards ranked of moderate or high significance that vary from the risks facing the entire planning area and estimates potential losses. These hazards include flood and wildfire.

Flood

Streams in Frisco include Ten Mile, Meadow, and Jug Creeks. 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).

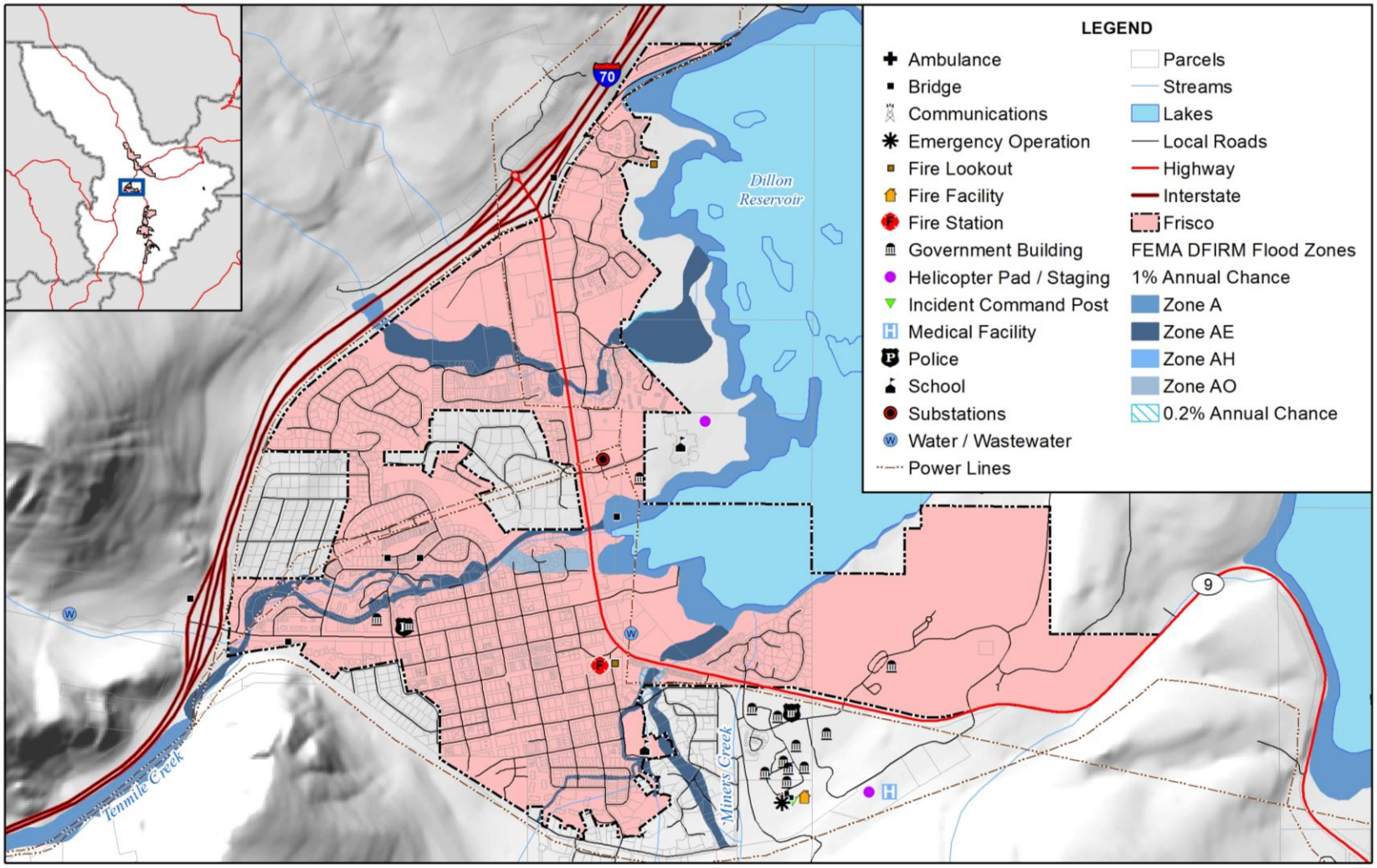
The principal flood problems along Ten Mile and Meadow Creeks from May through September are a result of snowmelt and/or intense rainstorms. Flows approximately equaling the 100-year flood were recorded on June 16, 1965, along Ten Mile Creek but no records of damages are available. Drainage complications have also contributed to flooding from ice jams. 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, 2011).

Existing Development

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.

The Town's DFIRM became effective on November 16, 2011. The DFIRM represents a 1% and 0.2% annual chance flood event in the Town of Frisco. Figure E.2 shows the DFIRM and the location of critical facilities in Frisco.

Figure E.2. DFIRM and Critical Facilities in Frisco



0 0.5 1 Miles

N

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, Preliminary DFIRM

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, which assumes that improved parcels have a structure of some type. The DFIRM flood zones were overlaid in GIS on the parcel centroid data to identify structures that would likely be inundated during a 1% annual chance and 0.2% annual chance flood event. An effort was made to remove centroids from the analysis that may have been located within a flood zone, but the actual structure, based on imagery interpretation, was located outside of the flood hazard area. Building improvement values for the points were based on the assessor's data. Property exposure located in flood hazard zones by land use type is shown in Table E.6. Frisco's AE Zone has the highest exposure with a total value of over $41 million.

Building related losses are shown in Table E.7, which indicates a total loss of over $15 million. Flooded structures for the 1% and 0.2% annual chance floods are depicted in Figure E.3. Table E.8 summarizes the footprint count in Frisco's flood hazard area. More information on the methodology for this loss estimation can be found in the Section 3.3 Vulnerability Assessment in the main plan.

There is one critical facility located in the floodplain in Frisco, an unnamed bridge.

Table E.6. Frisco—Flood Exposure by Land Use

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Zone A						
Open Space	1	0	$0	$0	$0	$0
Total	**1**	**0**	**$0**	**$0**	**$0**	**$0**
Zone AE						
Commercial	4	4	$2,432,476	$2,957,724	$2,957,724	$5,915,448
Open Space	6	0	$0	$0	$0	$0
Residential	43	40	$7,442,182	$23,695,335	$11,847,668	$35,543,003
Total	**53**	**44**	**$9,874,658**	**$26,653,059**	**$14,805,392**	**$41,458,451**
Zone AO						
Residential	27	25	$6,131,227	$9,288,341	$9,288,341	$18,576,682
Total	**27**	**25**	**$6,131,227**	**$9,288,341**	**$9,288,341**	**$18,576,682**
0.2% Annual Chance						
Residential	5	5	$378,706	$1,265,759	$632,880	$1,898,639
Total	**5**	**5**	**$378,706**	**$1,265,759**	**$632,880**	**$1,898,639**

Source: AMEC analysis of DFIRM

Table E.7. Frisco—DFIRM 1% and 0.2% Annual Chance Flood Estimated Building Losses

Flood Zone	Improved Parcel Count	Improved Value	Estimated Content Value	Total Value	Loss Estimate	Loss Ratio
Zone A	0	$0	$0	$0	$0	0.0%
Zone AE	44	$26,653,059	$14,805,392	$41,458,451	$10,364,613	0.6%
Zone AO	25	$9,288,341	$9,288,341	$18,576,682	$4,644,171	0.3%
1% Annual Chance	69	$35,941,400	$24,093,733	$60,035,133	$15,008,783	0.9%
0.2% Annual Chance	5	$1,265,759	$632,880	$1,898,639	$474,660	0.03%
Total	**74**	**$37,207,159**	**$24,726,612**	**$61,933,771**	**$15,483,443**	**0.9%**

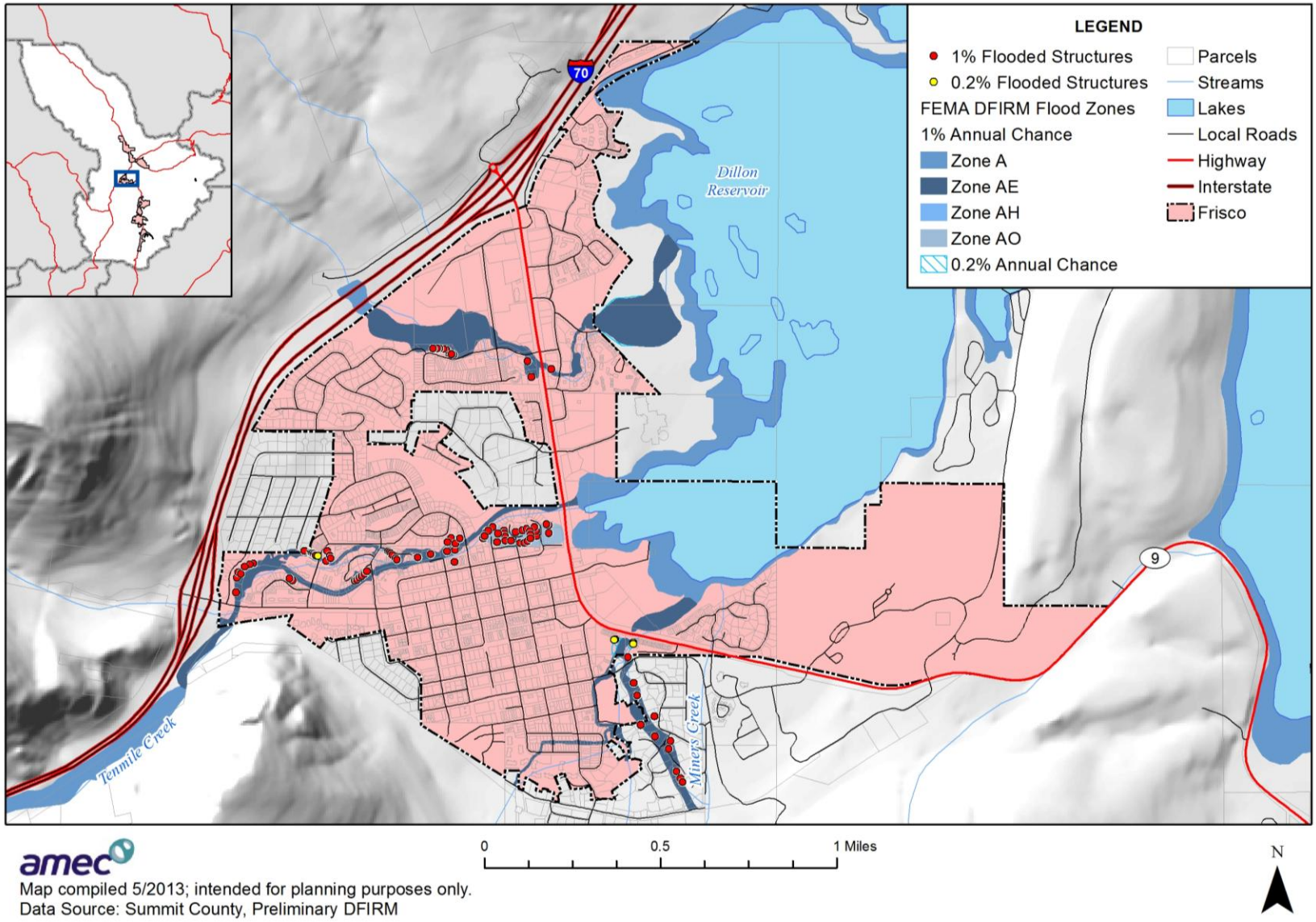
Source: AMEC analysis of DFIRM

Table E.8. Frisco Building Footprints in DFIRM Flood Zones

Flood Zone	Footprint Count
Zone A	3
Zone AE	48
Zone AO	24
1% Annual Chance	75
0.2% Annual Chance	4
Total	**79**

Source: Summit County

Figure E.3. DFIRM and Floodprone Properties in Frisco



amec

Map compiled 5/2013; intended for planning purposes only.
Data Source: Summit County, Preliminary DFIRM

National Flood Insurance Program

Frisco joined the National Flood Insurance Program (NFIP) on May 15, 1980. NFIP insurance data indicates that as of March 25, 2013, there were 152 flood insurance policies in force in the County with $34,595,000 of coverage. This is an increase of 44 policies since 2008. Eighty-seven of the policies were in A zones, and 65 were located outside of the Special Flood Hazard Area. There have been six historical claims for flood losses totaling $921; both were for post-FIRM residential properties. There were no repetitive or severe repetitive loss structures.

The Town of Frisco also participates in the Community Rating System (CRS). The Town has 1,100 total points for a CRS class ranking of 8, which provides a 10 percent ranking in flood insurance premiums for all policyholders 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

The five-year cycle visit for the CRS occurred in July 2008, and the Town's rating will remain 8.

Future Development

The Flood Hazard Area regulations in the 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.

Landslide, Mud Flow/Debris Flow, Rock Fall

Existing Development

Potential losses for landslide areas were estimated using Summit County GIS and assessor's data and were examined in terms of values and critical facilities at risk. GIS was used to create a centroid, or point, representing the center of each parcel polygon, which was overlaid on the landslide hazard polygons. The assessor's land and 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 polygon, that parcel is assumed to be at risk to the landslide. Values were summed and sorted by landslide hazard zone. Additional landslide hazard analysis was

completed using the more comprehensive USGS landslide deposits layer during the 2013 update. The results of the overlay analysis for the Town of Frisco are presented in Table E.9. Frisco has 10 building footprints in Colton landslide deposit areas based on data obtained from Summit County.

Table E.9. Frisco—Landslide Exposure by Land Use

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Colton Landslide Deposits						
Commercial	2	1	$1,027,366	$105,343	$105,343	$210,686
Residential	2	1	$1,136,734	$24,393,665	$12,196,833	$36,590,498
Total	**4**	**2**	**$2,164,100**	**$24,499,008**	**$12,302,176**	**$36,801,184**

Source: AMEC analysis

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.

Wildfire

A wildfire threat ranking was developed for the Summit County Community Wildfire Protection Plan by the County, fire protection districts, and U.S. Forest Service. It is based on fuel hazards, risk of wildfire occurrence, essential infrastructure at risk, community values at risk, and local preparedness and firefighting capability and classifies the wildfire threat as low, medium, high, and extreme. The wildfire threat GIS layer, updated in 2011, was used to determine the number of acres in each wildfire threat zone and map the wildfire threat in Frisco (see Table E.10 and Figure E.4). Figure E.5 shows the wildfire focus areas from the County CWPP and treatment areas in Frisco.

Table E.10 Frisco—Acreage in Wildfire Threat Zones

Low		Medium		High		Extreme		
Acres	%Total	Acres	%Total	Acres	%Total	Acres	%Total	Total Acres
1	0.1%	763	67%	367	32%	6	0.5%	1,137

Source: AMEC analysis with County data

Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard, the property values in Frisco were separated into wildfire threat zones, as shown in Table E.11.

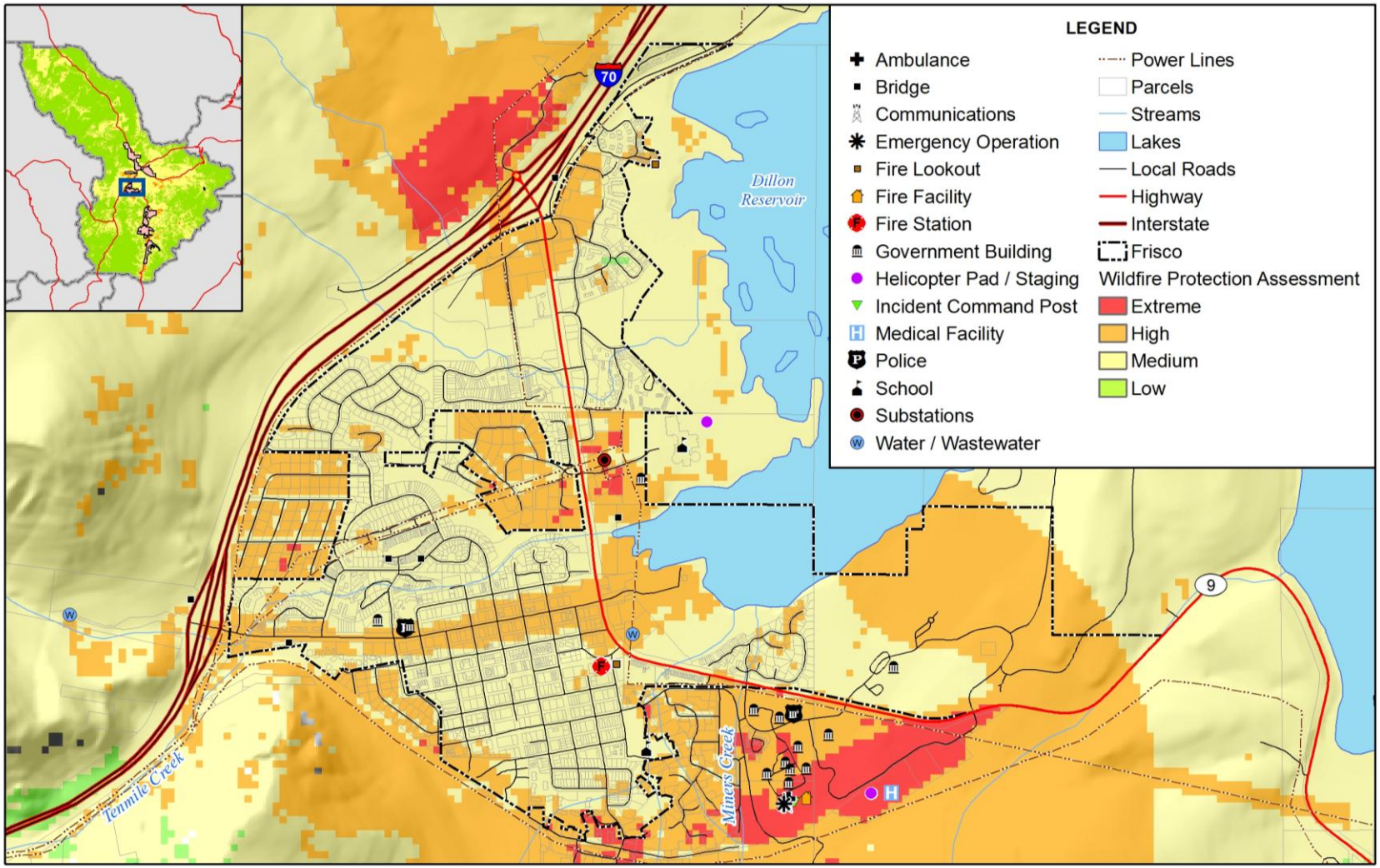
Table E.11. Frisco—Property Values in Wildfire Threat Zones

Threat Zone	Land Use	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Low	Residential	3	$671,414	$999,484	$499,742	$1,499,226
	Total	**3**	**$671,414**	**$999,484**	**$499,742**	**$1,499,226**
Medium	Commercial	27	$19,641,480	$43,794,544	$43,794,544	$87,589,088
	Mixed Use	3	$0	$29,196,672	$29,196,672	$58,393,344
	Residential	1,349	$247,545,930	$736,732,563	$368,366,282	$1,105,098,845
	Total	**1,379**	**$267,187,410**	**$809,723,779**	**$441,357,498**	**$1,251,081,277**
High	Commercial	19	$12,702,186	$15,049,673	$15,049,673	$30,099,346
	Government	2	$229,626	$29,747	$29,747	$59,494
	Mixed Use	44	$22,877,599	$48,731,233	$48,731,233	$97,462,466
	Residential	115	$27,631,929	$171,636,285	$85,818,143	$257,454,428
	Total	**180**	**$63,441,340**	**$235,446,938**	**$149,628,796**	**$385,075,734**
Extreme	Commercial	1	$702,809	$395,330	$395,330	$790,660
	Total	**1**	**$702,809**	**$395,330**	**$395,330**	**$790,660**
Grand Total		**1,563**	**$332,002,973**	**$1,046,565,531**	**$591,881,365**	**$1,638,446,896**

Source: AMEC analysis with County data.

Most of the acreage in Frisco is in moderate wildfire threat areas (67 percent), as is the majority of improved values (over $809 million).

Figure E.4. Wildfire Threat and Critical Facilities in Frisco



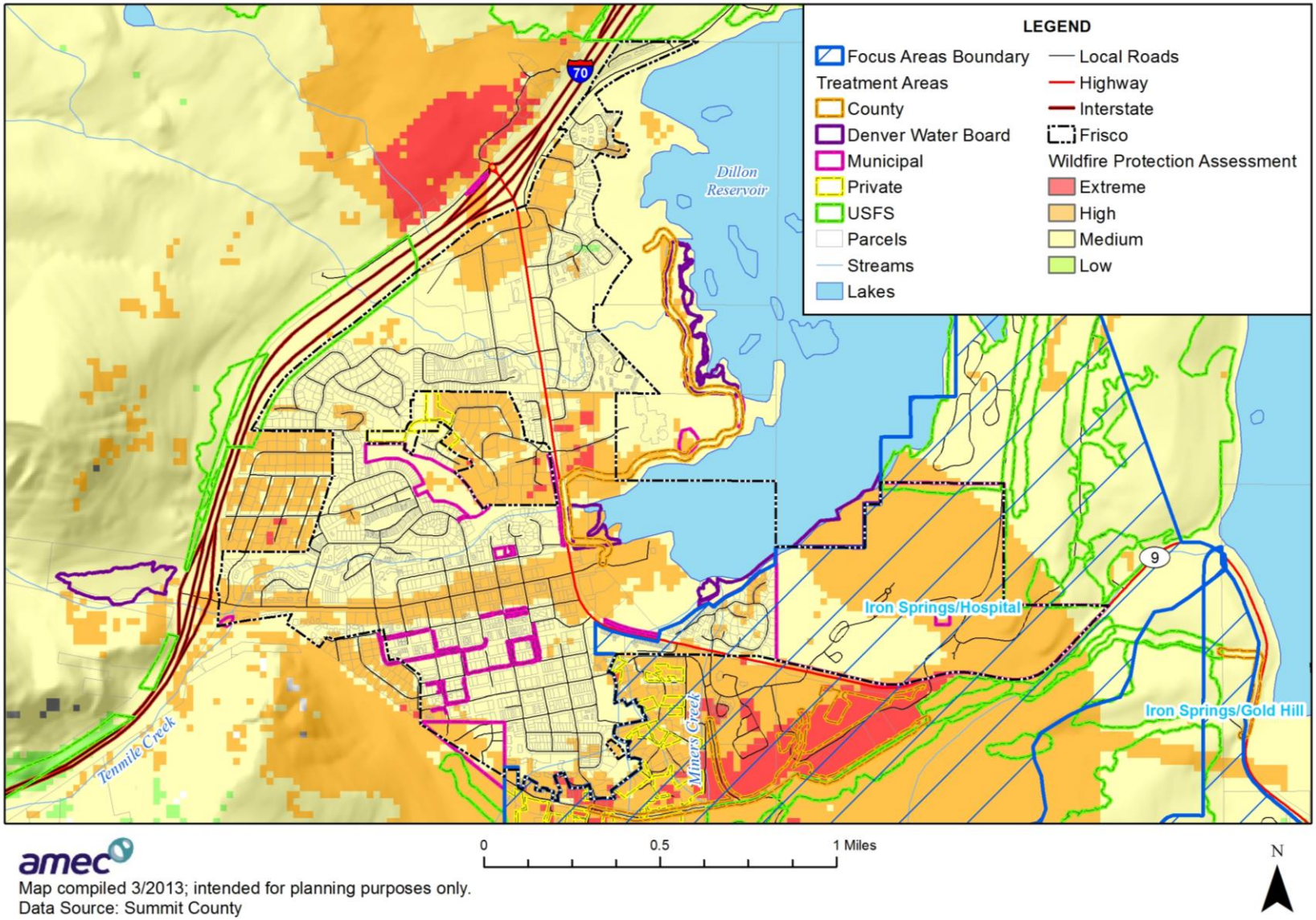
amec

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

0 0.5 1 Miles

N

Figure E.5. Wildfire Focus Areas and Treatment Areas in Frisco



There are five critical facilities located in high wildfire threat areas. The five facilities include a bridge, Frisco Public Works, Frisco Police Department, 39 School Road, and the Frisco Wastewater Treatment Plant. 1,481 buildings are located in Frisco's wildfire hazard areas, based on footprint count. This includes 15 buildings in extreme wildfire threat zones, 338 in high threat zones, and 1,128 in medium threat zones.

The Lake Dillon Fire Protection District, 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.

Future Development

Frisco does not have any policies or regulations in place to address new development in the wildland-urban interface.

Growth and Development Trends

Table E.12 illustrates how Frisco has grown in terms of population and number of housing units between 2000 and 2011.

Table E.12. Frisco—Change in Population and Housing Units, 2000-2011

2000 Population	2011 Population Estimate	Estimated Percent Change 2000-2011	2000 # of Housing Units	2011 Estimated # of Housing Units	Estimated Percent Change 2000-2011
2,443	2,661	+8.9	2,727	3,130	+14.8

Source: ACS 2011, factfinder2.census.gov

Because Frisco is essentially landlocked due to topography, the primary source of new growth is occurring as a result of the redevelopment of existing residential and commercial properties.

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.

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 Master Plan, updated every 5 years, last updated 2011
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
Growth Management Ordinance	Yes	
Floodplain Ordinance	Yes	
Other Special Purpose Ordinance (Stormwater, Steep Slope, Wildfire)	No	
Building Code	Yes	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	
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, 2011
Elevation Certificates	Yes	
Other	Yes	Community Rating System: 8

Town of Frisco Master Plan

The Frisco Master 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 current Master Plan does not identify goals or strategies that specifically relate to hazard mitigation, but rather supports a general framework of future sustainability and promotion of the community's health and welfare. Policies related to hazard mitigation include the following:

- **Policy ENV-1.3. Floodplain:** Maintain a floodplain/floodway management system to prevent future flood damage.
  - Action ENV-1.3.a. Monitor stream water levels during periods of high water runoff and continue to participate in the National Flood Insurance Program's Community Rating System, and maintain a class rating of 8 or better to allow residences that are in the floodplain a 10 percent discount on flood insurance.

- **Policy ENV-1.4. Wetlands and Riparian Areas:** Ensure the preservation and, where appropriate, enhancement of wetlands and riparian areas, as well as the provision of a suitable buffer around these features.
  - Principle ENV-2. Protect and preserve surrounding natural areas that contribute to and enhance the Town's quality of life and mountain character.

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 157 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 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.

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	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		Police Department	EPN System/Roam Secure System online in the next few months

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	

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

- 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

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 Judd Creek. This particular project has not yet been completed as of 2013.

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
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:	Ongoing
Status:	The mountain pine beetle infestation has been addressed by the Town over the past 5 or 6 years. The vast majority of pine beetle kill has been removed. The Town has provided annual funding for removal as well as funding to plant new trees.

Mitigation Action: Frisco—2 Public Education

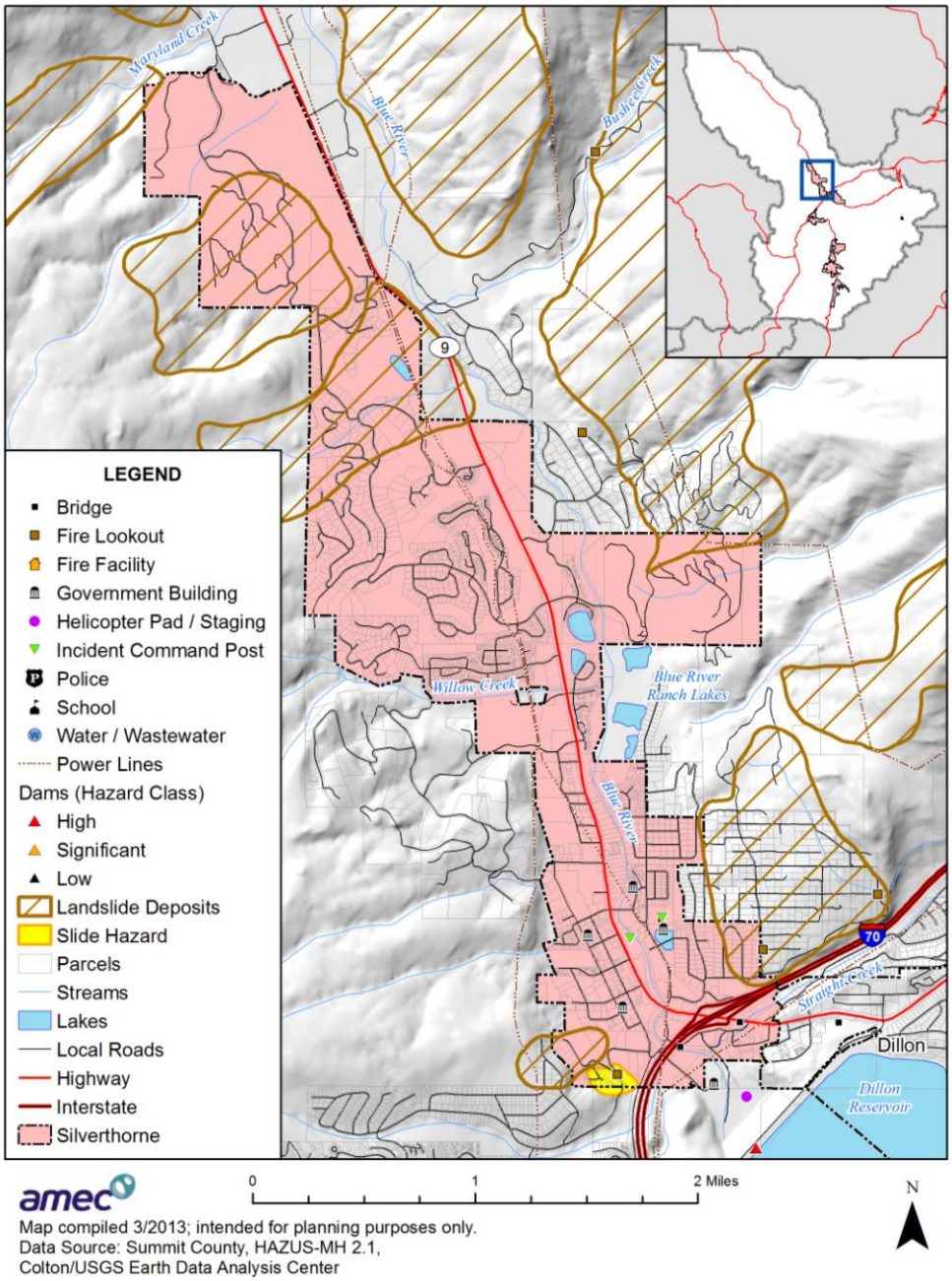
Jurisdiction:	Town of Frisco
Action Title:	Improve information on website about natural hazard risk and mitigation
Priority:	Low
Issue/Background	The Town of Frisco is continually improving information available on its website. The website is a primary tool for providing information to the public and could be used to help improve education on the natural hazards that impact Frisco, the actions that the local governments are taking to reduce risk, and actions that individuals and households can take to reduce potential losses.
Ideas for Implementation:	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)	• Improve public education and awareness • Protect public health and safety
Timeline:	One year and ongoing
Status:	Public information about natural hazard risk and mitigation is available on the Town's website.

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. The map also shows critical facilities and landslide deposits.

Figure F.1. Map 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 and Willow Creeks are tributaries of the Blue River that flow through Silverthorne.

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 temperatures 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 2013 population of the Town of Silverthorne was 3,956. The 2010 US Census recorded the population at 3,887. Select American Community Survey (ACS) 2011 estimates and 2010 US Census data of demographic and social characteristics for Silverthorne are shown in Table F.1.

Table F.1. Silverthorne—Demographic and Social Characteristics

Characteristic	2010	2011
Gender/Age		
Male (%)	54.0	51.4
Female (%)	46.0	48.6
Under 5 Years (%)	7.4	7.2
65 Years and Over (%)	7.5	5.6
Race/Ethnicity (one race)		
White (%)	80.6	93.8
Black or African American (%)	2.4	0.5
Asian (%)	1.3	1.7
Native Hawaiian and Other Pacific Islander	0.1	0.0
Other (%)	12.9	2.8
Hispanic or Latino (Of Any Race) (%)	27.6	12.4
Other		
Average Household Size	2.62	2.70
High School Graduate or Higher (%)	91.0	92.2

Source: ACS 2011, 2010 US Census, factfinder2.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 2011 ACS estimates, the industries that employed the highest percentages of Silverthorne's labor force were arts, entertainment, recreation, accommodation, and food services (24.7%); construction (17.5%); retail trade (16.5%); and finance and insurance, and real estate and rental and leasing (11.1%). Select economic characteristics for Silverthorne from the 2011 ACS estimates and the 2010 US Census are shown in Table F.2.

Table F.2. Silverthorne—Economic Characteristics

Characteristic	2010	2011
Families below Poverty Level	6.6%	9.4%
Individuals below Poverty Level	6.9%	7.3%
Median Home Value	$441,600	$466,800
Median Household Income	$71,691	$80,580
Per Capita Income	$31,839	$32,783
Population in Labor Force*	2,879	2,998

Source: ACS 2011, 2010 US Census, factfinder2.census.gov
*Population 16 years and over

F.2 Hazard Identification and Profiles

Silverthorne'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 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 Extent*	Probability*	Magnitude*	Hazard Rating
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Failure	Large	Unlikely	Catastrophic	High
Drought	Large	Likely	Limited	Moderate
Earthquake	Large	Unlikely	Limited	Low
Erosion/Deposition	Small	Likely	Limited	Low
Flood	Small	Likely	Critical	High
Hazardous Materials Release (Transportation)	Isolated	Occasional	Critical	High

Hazard Type	Geographic Extent*	Probability*	Magnitude*	Hazard Rating
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Likely	Limited	Low
Lightning	Large	Likely	Critical	Moderate
Mountain Pine Beetle Infestation	Medium	Likely	Limited	Moderate
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Small	Likely	Critical	High
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 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. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of moderate or high significance that may vary from other parts of the planning area. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment.

Community Asset Inventory

Table F.4 shows the total population, number of structures, land value, and assessed value of improvements to parcels in Silverthorne. Land values have been purposely excluded from the Total Value because land remains following disasters, and subsequent market devaluations are frequently short-term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

Table F.4. Silverthorne—Maximum Population and Building Exposure

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Land Value	Estimated Content Value	Total Value*
Commercial	154	87	$75,500,606	$71,921,782	$71,921,782	$143,843,564
Government	97	1	$475,265	$920,760	$920,760	$1,841,520
Industrial	17	17	$8,231,159	$5,494,808	$8,242,212	$13,737,020
Mixed Use	3	0	$0	$0	$0	$0
Open Space	70	3	$77,527	$6,318,190	$6,318,190	$12,636,380
Residential	1,775	1,488	$323,258,659	$667,602,729	$333,801,365	$1,001,404,094
Total	**2,116**	**1,596**	**$407,543,216**	**$752,258,269**	**$421,204,309**	**$1,173,462,578**

Source: Summit County Assessor 2013
*Content Value estimated

Table F.5 lists critical facilities and other community assets identified by Silverthorne's planning team as important to protect in the event of a disaster.

Table F.5. Silverthorne—Critical Facilities and Other Community Assets

Name of Asset	Replacement Value ($)	Hazard Concerns
Medical Offices	$3,000,000	
Police Station/Town Hall	$8,500,000	
Fire Station	$2,500,000	
Summit Education Center	$5,000,000	
Silverthorne Elementary School	$14,000,000	
Water and Wastewater Water Treatment Facilities	$40,000,000 plus collection/distribution systems	Blue River Wastewater Treatment Plant is in the floodplain but designed to withstand the 100-year flood.

Sources: Town of Silverthorne; Summit County GIS

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 DFIRM and Critical Facilities in Silverthorne.

Vulnerability by Hazard

This section analyzes existing and future structures and other assets at risk to hazards ranked of moderate or high significance that vary from the risks facing the entire planning area and estimates potential losses. These hazards include dam failure, flood, and wildfire.

Dam Failure

Existing Development

The Dillon Dam and Reservoir are located approximately .5 miles upstream of the southern corporate limits of Silverthorne. As discussed in Chapter 3 Risk Assessment, 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.

Future Development

Most future development occurring in Silverthorne will be at risk to a failure of the Dillon Dam.

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. There have been no serious flood problems in Silverthorne since the Dillon Dam began operating in 1963. The highest discharge has been about 2,000 cubic feet per second (cfs), which is less than the 10-year event.

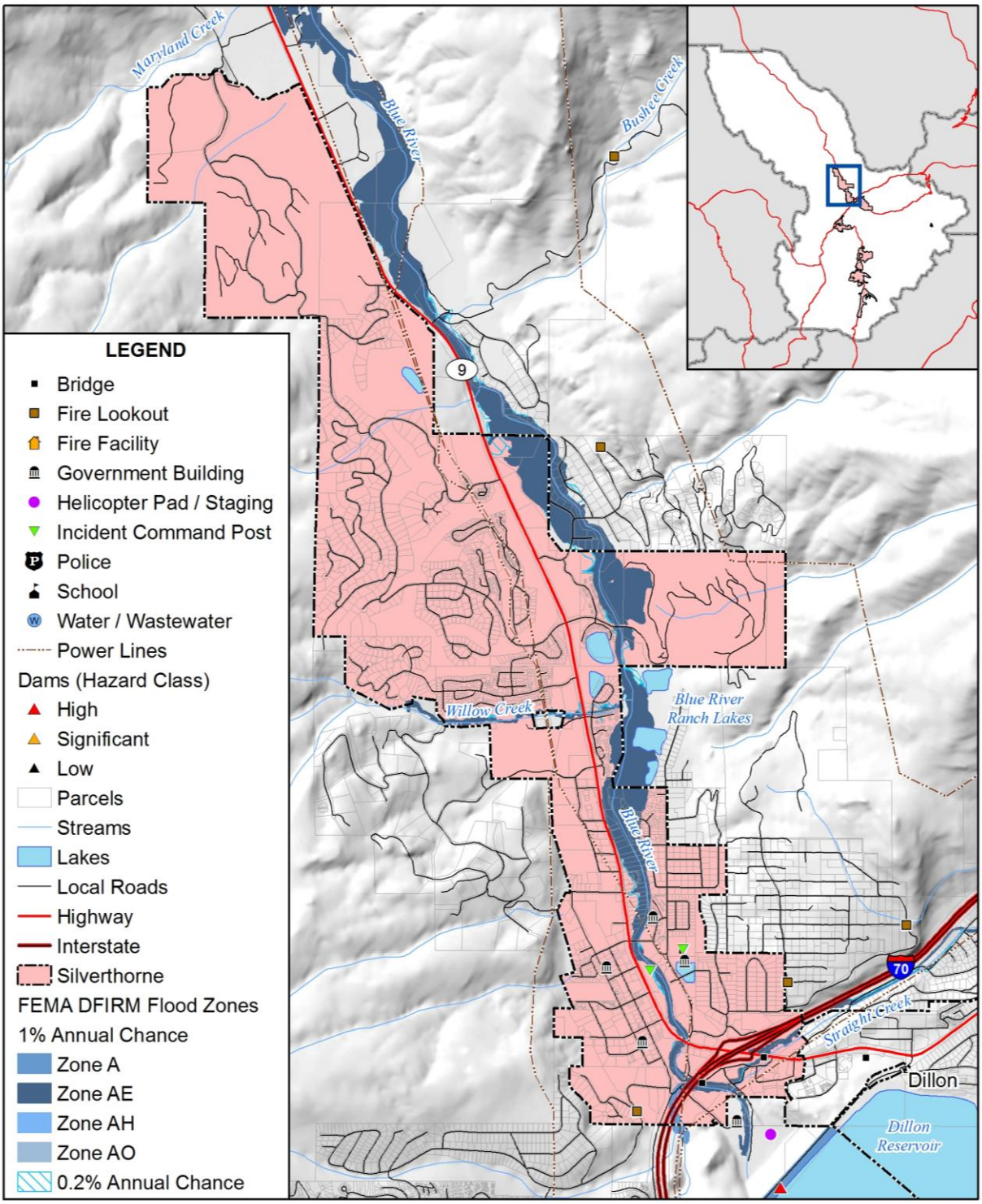
The largest flood on record prior to the construction of the dam was in 1918 when the combined flow of the Blue River, Ten Mile Creek, and the Snake River was 3,500 cfs just upstream of the present location of Silverthorne. U.S. Geological Survey records show high flows on all three streams during May 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.

Existing Development

The Town's DFIRM became effective on November 16, 2011. The DFIRM was used to generate a 1% and 0.2% annual chance flood event in the Town of Silverthorne. Figure F.2 shows the DFIRM and critical facilities.

Figure F.2. DFIRM and Critical Facilities in Silverthorne



amec

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, Preliminary DFIRM

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, which assumes that improved parcels have a structure of some type. The DFIRM flood zones were overlaid in GIS on the parcel centroid data to identify structures that would likely be inundated during a 1% annual chance and 0.2% annual chance flood event. An effort was made to remove centroids from the analysis that may have been located within a flood zone, but the actual structure, based on imagery interpretation, was located outside of the flood hazard area. Building improvement values for the points were based on the assessor's data. Property exposure located in flood hazard zones by land use type is shown in Table F.6. Silverthorne's 0.2% annual chance flood zone has the highest exposure with a total value of over $84 million.

Building related losses are shown in Table F.7, which indicates a total loss of over $33 million in Silverthorne. Flooded structures for the 1% and 0.2% annual chance floods are depicted in Figure F.3. Table F.8 summarizes the footprint count in Silverthorne's flood hazard area. More information on the methodology for this loss estimation can be found in the Section 3.3 Vulnerability Assessment in the main plan.

There is one critical facility located in flood zones in Silverthorne: the JSA Wastewater Treatment Plant (0.2% annual chance 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.

Table F.6. Silverthorne—Flood Exposure by Land Use

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Zone AE						
Commercial	6	4	$3,756,701	$8,221,297	$8,221,297	$16,442,594
Government	19	1	$475,265	$920,760	$920,760	$1,841,520
Open Space	7	0	$0	$0	$0	$0
Residential	45	43	$7,820,317	$19,709,368	$9,854,684	$29,564,052
Total	**77**	**48**	**$12,052,283**	**$28,851,425**	**$18,996,741**	**$47,848,166**
0.2% Annual Chance						
Commercial	1	0	$424,700	$0	$0	$0
Open Space	1	0	$0	$0	$0	$0
Residential	6	6	$969,900	$42,281,011	$42,281,011	$84,562,022
Total	**8**	**6**	**$1,394,600**	**$42,281,011**	**$42,281,011**	**$84,562,022**

Source: AMEC analysis of DFIRM

Table F.7. Silverthorne—DFIRM 1% and 0.2% Annual Chance Flood Estimated Building Losses

Flood Zone	Improved Parcel Count	Improved Value	Estimated Content Value	Total Value	Loss Estimate	Loss Ratio
Zone AE	48	$28,851,425	$18,996,741	$47,848,166	$11,962,042	1.0%
1% Annual Chance	48	$28,851,425	$18,996,741	$47,848,166	$11,962,042	1.0%
0.2% Annual Chance	6	$42,281,011	$42,281,011	$84,562,022	$21,140,506	1.8%
Total	**54**	**$71,132,436**	**$61,277,752**	**$132,410,188**	**$33,102,547**	**2.8%**

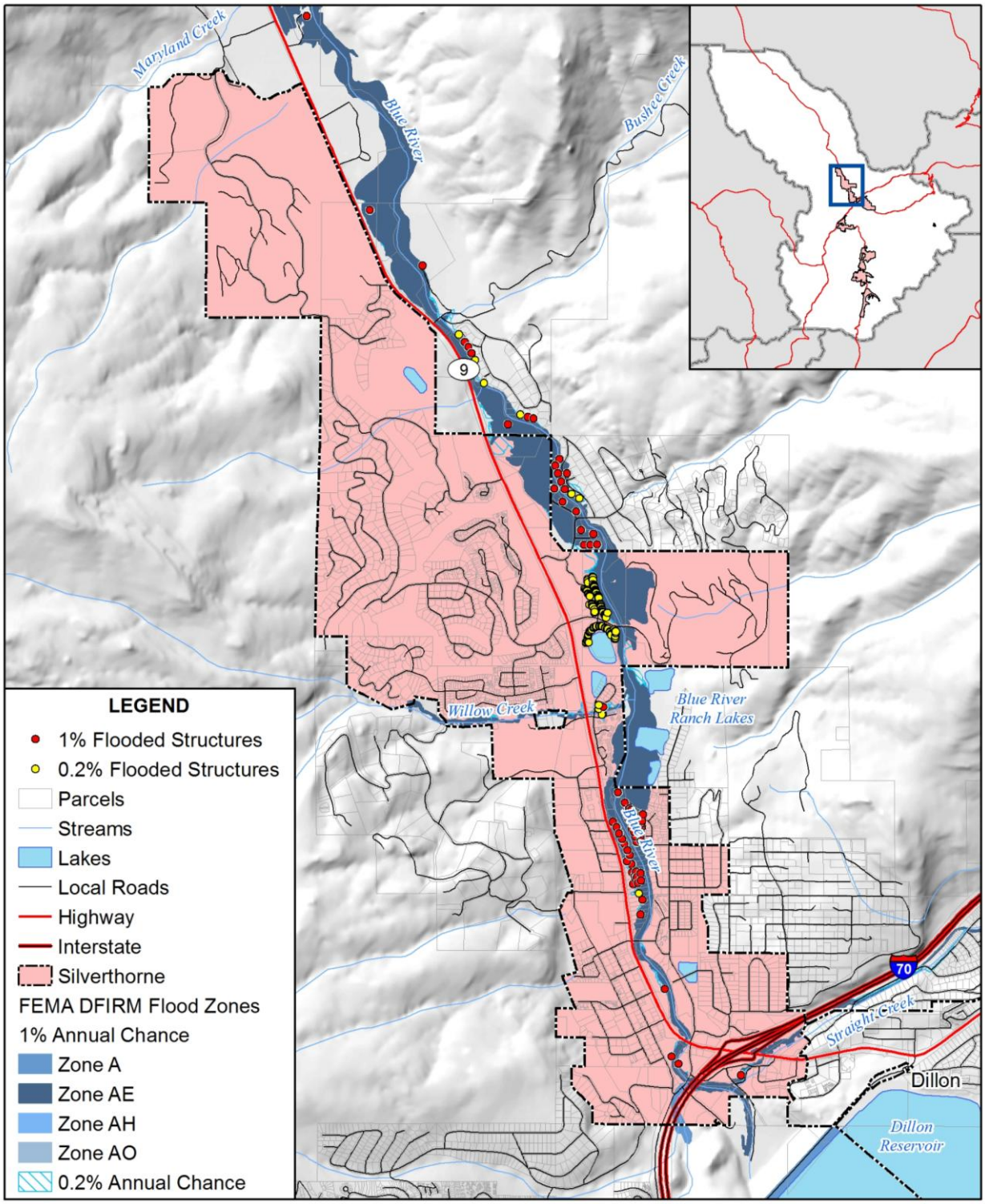
Source: AMEC analysis of DFIRM

Table F.8. Silverthorne Building Footprints in DFIRM Flood Zones

Flood Zone	Footprint Count
Zone AE	81
1% Annual Chance **Total**	**81**
0.2% Annual Chance	12
Total	**93**

Source: Summit County

Figure F.3. DFIRM and Floodprone Properties in Silverthorne



amec

0 1 2 Miles

N

Map compiled 5/2013; intended for planning purposes only.
Data Source: Summit County, Preliminary DFIRM

National Flood Insurance Program

Silverthorne joined the National Flood Insurance Program (NFIP) on May 1, 1980. NFIP insurance data indicates that as of March 25, 2013, there were 84 flood insurance policies in force in the Town with $21,659,500 of coverage. This is an increase of 15 policies since 2008. Twenty-four of the policies were in A zones, and 60 were located outside of the Special Flood Hazard Area.

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.

Silverthorne participates in the Community Rating System (CRS). The Town has 770 total points for a CRS class ranking of 9, which provides a 5 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

Future Development

Based upon the 2011 FEMA Flood Insurance Study, there is development within the 100-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.

Landslide, Mud Flow/Debris Flow, Rock Fall

Existing Development

Geologic hazards in Silverthorne include avalanches, landslides, rock falls, mudflows, debris fans, and unstable slopes. The majority of the Silverthorne community is located in areas that have little potential for these hazards. However, as Silverthorne grows and development on steep hillsides continues to be considered, the hazard potential will increase.

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). There are 132 building footprints located on Colton landslide deposits and 1 building footprint located in local landslide hazard areas in Silverthorne.

Potential losses for landslide areas were estimated using Summit County GIS and assessor's data and were examined in terms of values and critical facilities at risk. GIS was used to create a centroid, or point, representing the center of each parcel polygon, which was overlaid on the landslide hazard polygons. The assessor's land and 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 polygon, that parcel is assumed to be at risk to the landslide. Values were summed and sorted by landslide hazard zone. Additional landslide hazard analysis was completed using the more comprehensive USGS landslide deposits layer during the 2013 update. The results of the overlay analysis for the Town of Silverthorne are presented in Table F.9.

Table F.9. Silverthorne—Landslide Exposure by Land Use

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Colton Landslide Deposits						
Commercial	8	4	$1,428,819	$1,307,964	$1,307,964	$2,615,928
Government	8	0	$0	$0	$0	$0
Open Space	4	0	$8,323	$0	$0	$0
Residential	145	96	$39,064,240	$67,520,550	$33,760,275	$101,280,825
Total	**165**	**100**	**$40,501,382**	**$68,828,514**	**$35,068,239**	**$103,896,753**

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Local Landslide Hazards						
Government	11	0	$0	$0	$0	$0
Total	**11**	**0**	**$0**	**$0**	**$0**	**$0**

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. Snow removal also becomes an increasingly greater problem as more homes are built. The surface runoff that results from snowmelt increases the erosion hazards on cut and fill slopes. Although seeding can minimize this hazard, it can be difficult to establish viable plant growth in these areas. 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.

Wildfire

Existing Development

A wildfire threat ranking was developed for the Summit County Community Wildfire Protection Plan by the County, fire protection districts, and U.S. Forest Service. It is based on fuel hazards, risk of wildfire occurrence, essential infrastructure at risk, community values at risk, and local preparedness and firefighting capability. It classifies the wildfire threat as low, medium, high, and extreme. The wildfire threat GIS layer, updated in 2011, was used to determine the number of acres in each wildfire threat zone and map the wildfire threat in Silverthorne (see Table F.10 and Figure F.3). Figure F.4 shows the wildfire focus areas from the County CWPP and treatment areas in Silverthorne.

Table F.10 Silverthorne—Acreage in Wildfire Threat Zones

Low		Medium		High		Extreme		
Acres	%Total	Acres	%Total	Acres	%Total	Acres	%Total	Total Acres
1,652	64%	927	36%	13	0.5%	-	-	2,591

Source: AMEC analysis with County data

Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard, the property values in Silverthorne were separated into wildfire threat zones, as shown in Table F.11

Table F.11. Silverthorne—Property Values in Wildfire Threat Zones

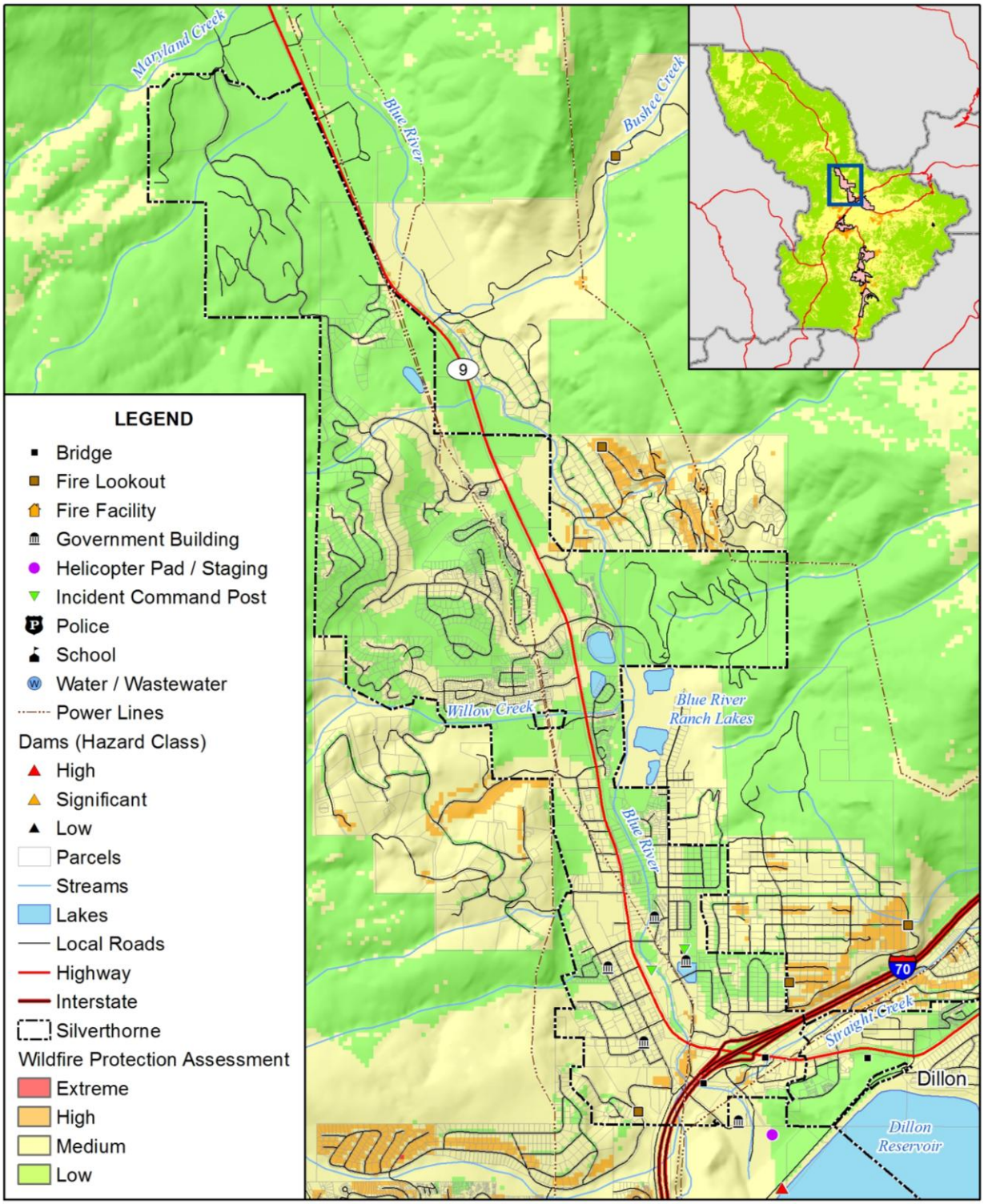
Threat Zone	Land Use	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Low	Commercial	4	$201,070	$1,010,643	$1,010,643	$2,021,286
	Industrial	1	$632,089	$73,880	$110,820	$184,700
	Open Space	1	$9,471	$91,272	$91,272	$182,544
	Residential	848	$156,618,422	$376,126,962	$188,063,481	$564,190,443
	Total	**854**	**$157,461,052**	**$377,302,757**	**$189,276,216**	**$566,578,973**
Medium	Commercial	81	$51,170,404	$65,976,278	$65,976,278	$131,952,556
	Government	1	$475,265	$920,760	$920,760	$1,841,520
	Industrial	15	$6,089,336	$4,457,513	$6,686,269.50	$11,143,783
	Open Space	2	$0	$6,226,918	$6,226,918	$12,453,836
	Residential	640	$113,153,264	$291,475,767	$145,737,884	$437,213,651
	Total	**739**	**$170,888,269**	**$369,057,236**	**$225,548,109**	**$594,605,345**
High	Commercial	2	$2,060,989	$4,934,861	$4,934,861	$9,869,722
	Industrial	1	$1,509,734	$963,415	$1,445,123	$2,408,538
	Total	**3**	**$3,570,723**	**$5,898,276**	**$6,379,984**	**$12,278,260**
Grand Total		**1,596**	**$331,920,044**	**$752,258,269**	**$421,204,309**	**$1,173,462,578**

Source: AMEC analysis with County data

Most of the acreage in Silverthorne is in low to medium wildfire threat zones. These zones have the most property value at risk as well. The Lake Dillon Fire Protection District, 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.

There is one critical facility in the high wildfire threat zone in Silverthorne, the Buffalo Mountain Wastewater Treatment Plant. One thousand seven hundred and fifteen (1,715) buildings are located in Silverthorne's wildfire hazard areas, based on footprint count. This includes 15 buildings in high wildfire threat zones, 979 in medium threat zones, and 721 in low threat zones.

Figure F.3. Wildfire Threat and Critical Facilities in Silverthorne



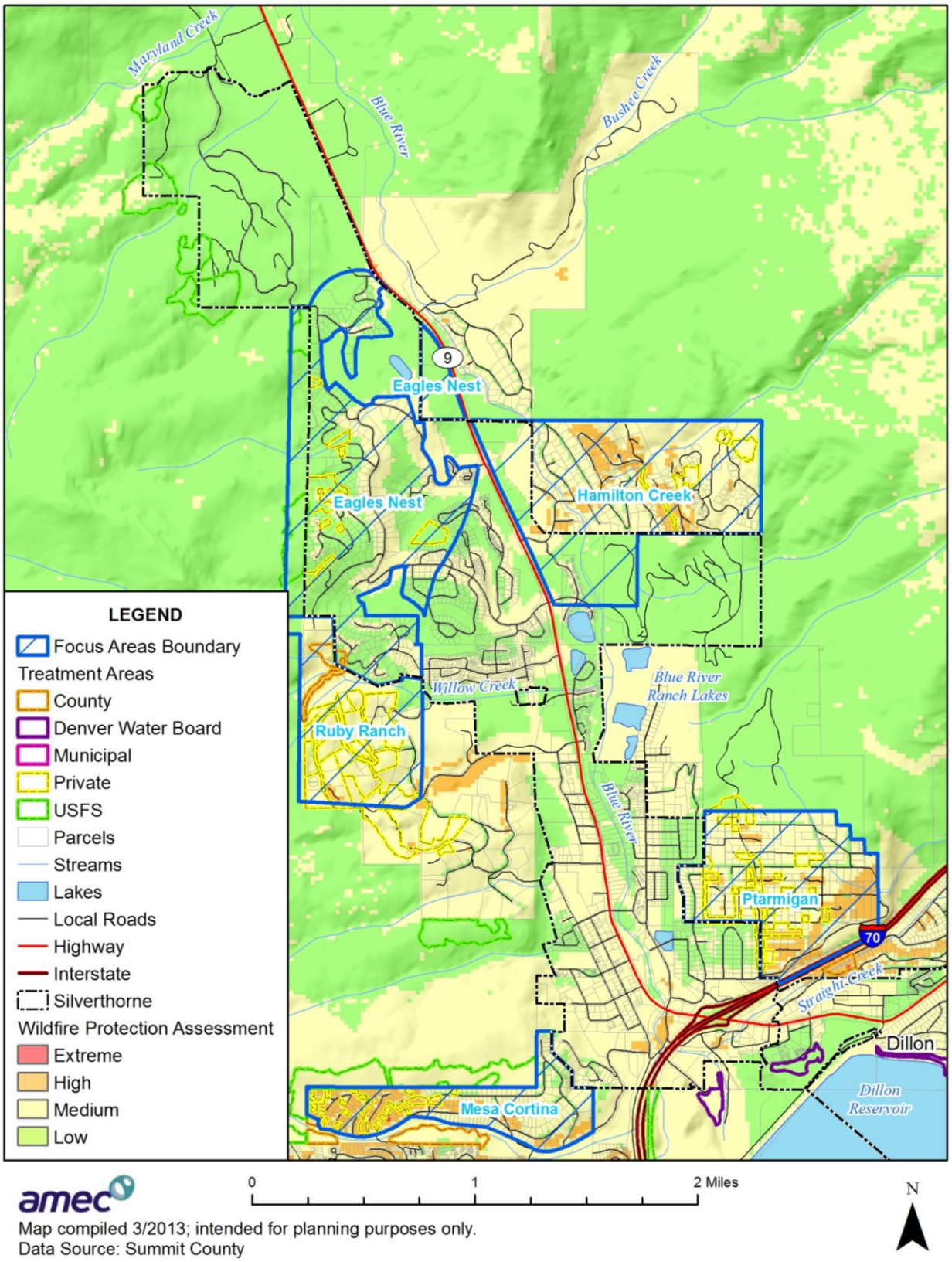
amec

0 1 2 Miles

N

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

Figure F.4. Wildfire Focus Areas and Treatment Areas in Silverthorne



amec

Map compiled 3/2013; intended for planning purposes only.
Data Source: Summit County

Future Development

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).

Silverthorne's Fire Hazard Mitigation ordinance establishes permitted fire mitigation standards for new and existing development.

Growth and Development Trends

Table F.12 illustrates how Silverthorne has grown in terms of population and number of housing units between 2000 and 2011.

Table F.12. Silverthorne—Change in Population and Housing Units, 2000-2011

2000 Population	20011Population Estimate	Estimated Percent Change 2000-2011	2000 # of Housing Units	2011 Estimated # of Housing Units	Estimated Percent Change 2000-2011
3,196	3,815	+19.4	1,582	2,051	+29.6

Source: ACS 2011, factfinder2.census.gov

In 2007, the Town of Silverthorne building department issued permits for 32 single-family residences and 8 multi-family units. The majority of this growth occurred in the subdivisions of Three Peaks, Eagles Nest, and Willowbrook. 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. In 2008, there were a total of 2,944 zoned residential units, of which 2,079 have been platted, and 1,813 have been built.

The Town of Silverthorne, in combination with the Lake Dillon Fire Protection District, recently approved construction of a new joint facility. It will replace the existing fire station in Silverthorne and will also provide office space for the Town's Public Works Department. The total cost of the facility will be approximately $8 million. It will be located on the north end of

town along Highway 9, near the elementary school. It will be located outside of the 100-year floodplain and in an area of low wildfire threat.

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.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 Silverthorne.

Table F.13. Silverthorne—Regulatory Mitigation Capabilities

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
Master Plan	Yes	Last updated 2008
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	2006 International Building Code, 2006 International Fire Code and Amendment, 2006 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, 2011
Elevation Certificates	Yes	
Other	Yes	Community Rating System Rating: 9

Silverthorne Comprehensive Plan, 2008

The Silverthorne Comprehensive Plan defines a long-term vision for the Town. In addition to defining the community's view of its future, the Comprehensive Plan outlines goals, policies, and specific strategies to guide decision makers in the future. 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.

Chapter 3 Planning Influences describes environmental constraints to development in Silverthorne and provides an overview of geologic hazards, slope and topography, floodplains and wetlands, and wildfire hazards.

Chapter 4 Land Use Element includes the following goals and policies related to hazard mitigation:

- **Goal Land Use (LU) 1**: To establish a pattern of future land uses which will promote the highest degree of health, safety, efficiency, and well being for all segments of the community, and make the most efficient use of land, community facilities, services, while protecting the environment and natural resources.
- **Goal LU 5:** To protect the environment and improve it whenever and wherever possible.
  - Policy LU 5.1: The Town shall prohibit 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.
  - Policy LU 5.2: The Town shall prohibit development on slopes greater than 30 percent and require engineering investigations of steep sites during project review. Development on slopes in excess of 15 percent shall maintain the maximum vegetative cover possible to protect soils, prevent land slippage, and retain wildlife habitat and open space resources.
  - Policy LU 5.3: The Town shall encourage the paving of gravel roadways, driveways and parking lots to decrease pollution from dust.
  - Policy LU 5.10: The Town shall require new and existing developments to provide adequate measures to control any adverse effects to the water quality and groundwater resources of the region.
  - Policy LU 5.11: The Town shall develop a storm water management plan to protect water quality.
- **Goal LU 6:** To preserve the unique natural, physical characteristics of Silverthorne.
  - Policy LU 6.1: The Town shall establish open space land dedication requirements that preserve and protect areas of significance to the community. These include but are not

limited to wetlands, steep slopes, 100-year floodplains, significant landforms, significant vegetation, and view corridors.

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, 2011

The flood damage prevention ordinance was recently re-adopted via ordinance 1) to reflect FEMA DFIRM mapping effective dates, reflecting November 2011 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 wildfire**s** 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.

Administrative/Technical Mitigation Capabilities

Table F.14 identifies the personnel responsible for activities related to mitigation in Silverthorne.

Table F.14. Silverthorne—Administrative and Technical Mitigation Capabilities

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.15 identifies financial tools or resources that Silverthorne could potentially use to help fund mitigation activities.

Table F.15. Silverthorne—Fiscal Mitigation Capabilities

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

The Town of Silverthorne is currently investigating forming a special improvement district to fund burying utility lines underground.

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 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.6 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.

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 new action item was introduced in 2013 related to Floodplain Mapping and Management (see Action #7).

Mitigation Action: Silverthorne—1 Mountain Pine Beetle Ordinance

Jurisdiction: Town of Silverthorne

Action Title: Continue to implement mountain pine beetle program and enforce ordinance

Priority: High

Issue/Background Silverthorne's Code Section 4-8-44 (adopted in 2006) requires land owners 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. Land owners 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: Ongoing for next three to five years

Status: Completed/ongoing. After changing the Town Code, the Town was surveyed for dead pine beetle trees in 2007, 2008, and 2009. During those years the

ordinance was heavily enforced. Since 2010 there have been very few complaints regarding dead pine beetle trees. The Town has greatly reduced the fire hazard and brought the Town into compliance.

Mitigation Action: Silverthorne—2 Emergency Power for Wastewater Treatment Plant

Jurisdiction:	Town of Silverthorne
Action Title:	Insure emergency power for wastewater treatment plant during extended power outage
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:	Ongoing in 2013. Backup generation is installed and operational as of 1999, additional automation and capacity are being evaluated.

Mitigation Action: Silverthorne—3 Emergency Power for Water Distribution

Jurisdiction:	Town of Silverthorne
Action Title:	Ensure continued water distribution during extended power outage
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:	Completed
Status:	Completed/ongoing. The Town has completely automated backup power systems for all pressure zones. A portable Generator will be added in the next two years.

Mitigation Action: Silverthorne—4 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
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 stand by. 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:	Purchase in 2015.
Status:	Completed. Continuous explosive gas monitoring, with automated venting is installed. This system is connected to the plant alarm call-out system

Mitigation Action: Silverthorne—5 Cottonwood Shared Facilities

Jurisdiction:	Town of Silverthorne
Action Title:	Cottonwood shared Silverthorne Public Works and Lake Dillon Fire Protection District Facilities
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 the Lake Dillon Fire Protection District 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 (Zach Margolis) / Lake Dillon Fire Protection District (Dave Parmley)
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)	The Lake Dillon Fire Protection District's 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 Lake Dillon Fire Protection District is unknown/uncertain.
Status:	New in 2013

Mitigation Action: Silverthorne—6 Floodplain Mapping and Management

Jurisdiction: Town of Silverthorne

Action Title: Floodplain mapping and management

Priority: Medium

Issue/Background There are several components:

1) Summit County unincorporated areas and municipalities have recently undergone a digital conversion and Map Modernization updating of FEMA flood hazard maps. Maps became effective in November of 2011. The cost of the countywide remapping was budgeted at being approximately $100,000. Ninety percent (90%) of this was funded by FEMA and/or the State. Summit County was asked to contribute 10%, or approximately $20,000. Silverthorne contributed $5,000 of this amount. The new maps are supposedly more accurate. The digital format allows for overlay on digital aerial photos for much clearer presentation and understanding where the flood zone boundary is. The Town has imported this information into our GIS for display, presentation and analysis of proposed and existing land uses within or near the floodplain. Expanded use of digital information in our GIS and further development potential of it is of interest to us.

2) 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 recently updated the CRS program guidance in 2012. 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.

3) The Town has recently gone through a FEMA Letter of Map Revision (LOMR) process which remapped a portion of the floodplain based on better survey information and rigorous study, modeling and analysis from a reputable engineering firm, Wright Water Engineers. The study resulted in a better and more accurate floodplain delineation, which among other things will be used during the land use review process. Future projects will be required to be constructed to be in compliance with FEMA floodplain regulations – with the ultimate goal of preserving life, safety and property. The new, FEMA approved mapping will become effective in 2013. The Town invested between $40,000 and $50,000, approximately, on the CLOMR/LOMR process.

4) 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 (Dan Gietzen)

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: New in 2013

Mitigation Action: Silverthorne—7 Community Evacuation

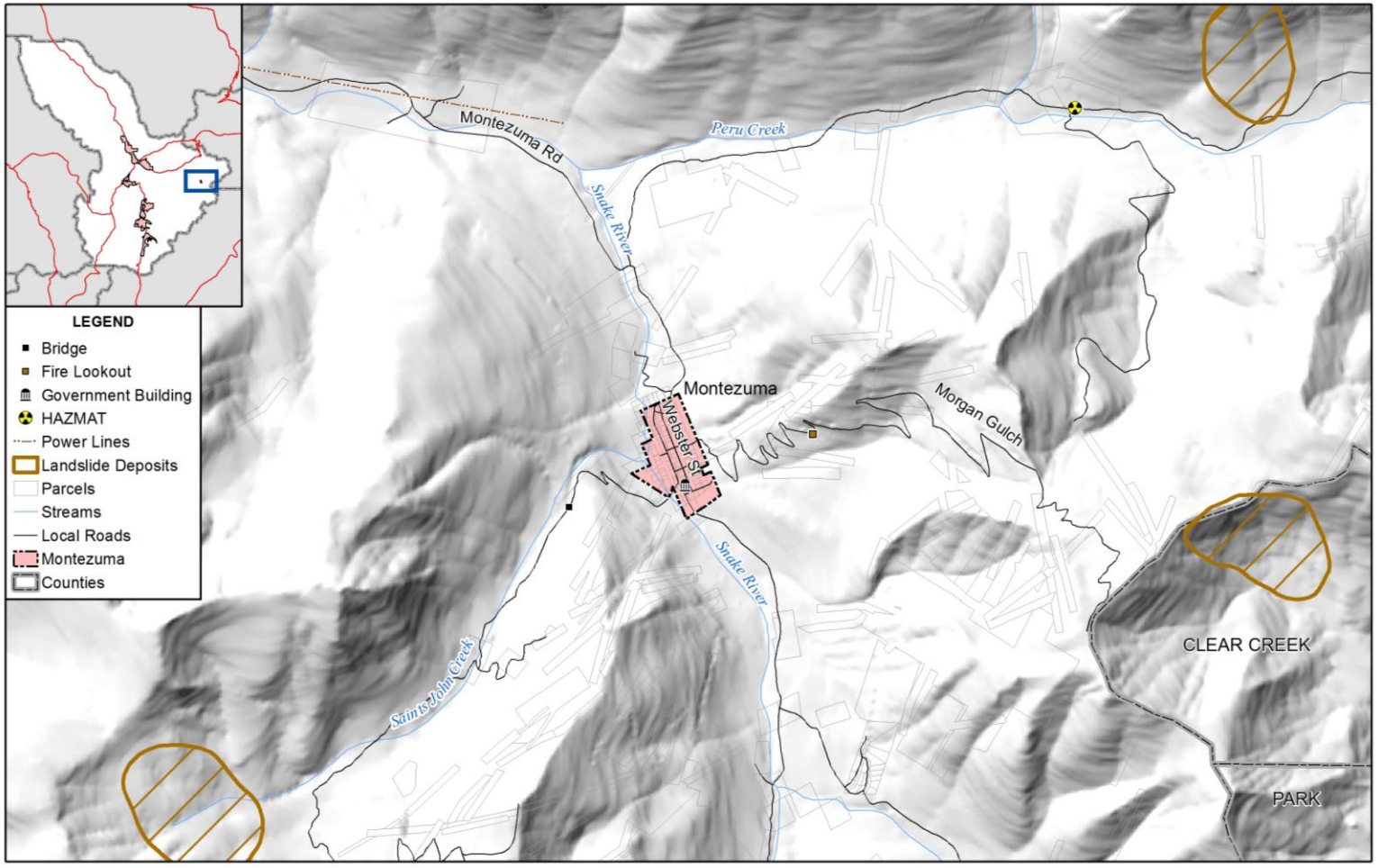
Jurisdiction:	Town of Silverthorne
Action Title:	Community evacuation
Priority:	High
Issue/Background	Develop procedures to quickly, efficiently and effectually evacuate critically identified areas of the community.
Ideas for Implementation:	Update the Town's current evacuation plan, look into advanced mapping programs to allow real-time updates, research other towns and their evacuation plans.
Responsible Agency:	Silverthorne Police Department / Chief Mark Hanschmidt
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:	Within 3 years
Status:	New in 2013

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. The map also shows critical facilities and landslide deposits.

Figure G.1. Map of Montezuma



amec

Map compiled 8/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1,
Colton/USGS Earth Data Analysis Center

Geography

According to the U.S. Census Bureau, the Town of Montezuma has a total area of 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 elevation.

Population

The estimated 2011 population of Montezuma was 77. The 2010 Census recorded the population at 65. Select American Community Survey (ACS) 2011 and 2010 US Census demographic and social characteristics for Montezuma are shown in Table G.1.

Table G.1. Montezuma—Demographic and Social Characteristics

Characteristic	2010	2011
Gender/Age		
Male (%)	63.1	68.8
Female (%)	36.9	31.2
Under 5 Years (%)	4.6	0.0
65 Years and Over (%)	3.1	0.0
Race/Ethnicity (one race)		
White (%)	86.2	100
Black (%)	3.1	0
American Indian and Alaska Native (%)	0	0
Asian (%)	0	0
Two or More Races (%)	0	0
Other (%)	9.2	0
Hispanic or Latino (Of Any Race) (%)	10.8	0
Other		
Average Household Size	2.60	2.48
High School Graduate or Higher (%)*	100	99.9

Source: U.S. Census Bureau, ACS 2011, 2010 US Census, factfinder2.census.gov/
*Source: ACS (2006-2010)

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.

Economy

The Town of Montezuma is a residential community with little industry or commercial business. According to the 2011 ACS estimates, the industries that employed the highest percentages of Montezuma's labor force were arts, entertainment, recreation, accommodation, and food services (46.2%); information (13.5%); agriculture, forestry, fishing and hunting, and mining (13.5%); construction (11.5%); and professional, scientific, and management, and administrative and waste management services (9.6%). Select economic characteristics for Montezuma from the 2011 ACS estimates and 2010 US Census are shown in Table G.2.

Table G.2. Montezuma—Economic Characteristics

Characteristic	2010	2011
Families below Poverty Level	0%	0%
Individuals below Poverty Level	11.5%	13%
Median Home Value	$625,000	$541,700
Median Household Income	$68,333	$71,094
Per Capita Income	$29,142	$28,979
Population in Labor Force*	71**	67

Source: ACS (2011), 2010 US Census, factfinder2.census.gov/
*Age 16 years and over
**Source: ACS (2006-2010)

G.2 Hazard Identification and Profiles

Montezuma'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 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 Extent*	Probability*	Magnitude*	Hazard Rating
Avalanche	Small	Unlikely	Limited	Low
Dam Failure	Small	Unlikely	Negligible	Low
Drought	Large	Likely	Limited	High
Earthquake	Small	Unlikely	Limited	Low
Erosion/Deposition	Large	Likely	Critical	Medium
Flood	Medium	Likely	Limited	Medium
Hazardous Materials Release	Medium	Unlikely	Limited	Medium
Landslide/Debris Flow/Rock Fall	Small	Unlikely	Limited	Low
Lightning	Large	Likely	Critical	Medium
Mountain Pine Beetle Infestation	Large	Likely	Critical	High
Severe Winter Weather	Large	Likely	Critical	High
Wildfire	Large	Likely	Catastrophic	High
Windstorm	Large	Likely	Critical	Medium

*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 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 as a whole, which has already been assessed in Section 3.3 Vulnerability Assessment in the main plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of moderate or high significance that may vary from other parts of the planning area. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment in the main plan.

Community Asset Inventory

Table G.4 shows the total population, number of structures, land value, and assessed value of improvements to parcels in Montezuma. Land values have been purposely excluded from the Total Value because land remains following disasters, and subsequent market devaluations are frequently short-term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

Table G.4. Montezuma—Maximum Population and Building Exposure

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value*	Total Value**
Residential	85	46	$8,278,991	$9,166,128	$4,583,064	$13,749,192
Total	**85**	**46**	**$8,278,991**	**$9,166,128**	**$4,583,064**	**$13,749,192**

Source: Summit County Assessor 2013
*Content Value estimated; **Includes contents and improvements only

Montezuma's planning team identified the following assets:

Table G.5. Montezuma Asset Inventory

Name of Asset	Type*	Replacement Value	Hazard Specific Issues
Water Tank	LL/EA	$300,000.00	Freezing/Flooding
Town Hall	EA/HCNA	100,000.00	Flammable
Historic School House	HCNA	150,000.00	Flammable
Fire Hydrants	LL	65,000.00	Freezing
Culverts	LL	120,000.00	Freezing/ Flooding
Hardwick Street Bridge	LL	10,000.00	Flooding/Erosion

*EF: Essential Facilities; LS: Life Safety Facilities; LL: Life line facilities; HCNA: Historic, cultural or natural assets; EA: Economic Asset

Vulnerability by Hazard

This section analyzes existing and future structures and other assets at risk to hazards ranked of medium or high significance that vary from the risks facing the entire planning area and estimates potential losses. These hazards include flood and wildfire.

Flood

Existing Development

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, which assumes that improved parcels have a structure of some type. GIS analysis showed that there are no flooded parcels or critical facilities in floodplains in Montezuma. The Town does have some drainage issues which can cause problems with property damage, road maintenance, and sedimentation of the Snake River. The Town hired a professional engineer to assess the drainage issues and provide a drainage improvement plan. See Montezuma Mitigation Action 2 for further details.

Table G.6. Montezuma—Flood Exposure by Land Use

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
No flooded parcels	0	0	$0	$0	$0	$0
Total	**0**	**0**	**$0**	**$0**	**$0**	**$0**

Source: AMEC analysis of DFIRM

Wildfire

Existing Development

A wildfire threat ranking was developed for the Summit County Community Wildfire Protection Plan by the County, fire protection districts, and U.S. Forest Service. It is based on fuel hazards, risk of wildfire occurrence, essential infrastructure at risk, community values at risk, and local preparedness and firefighting capability and classifies the wildfire threat as low, medium, high, and extreme.

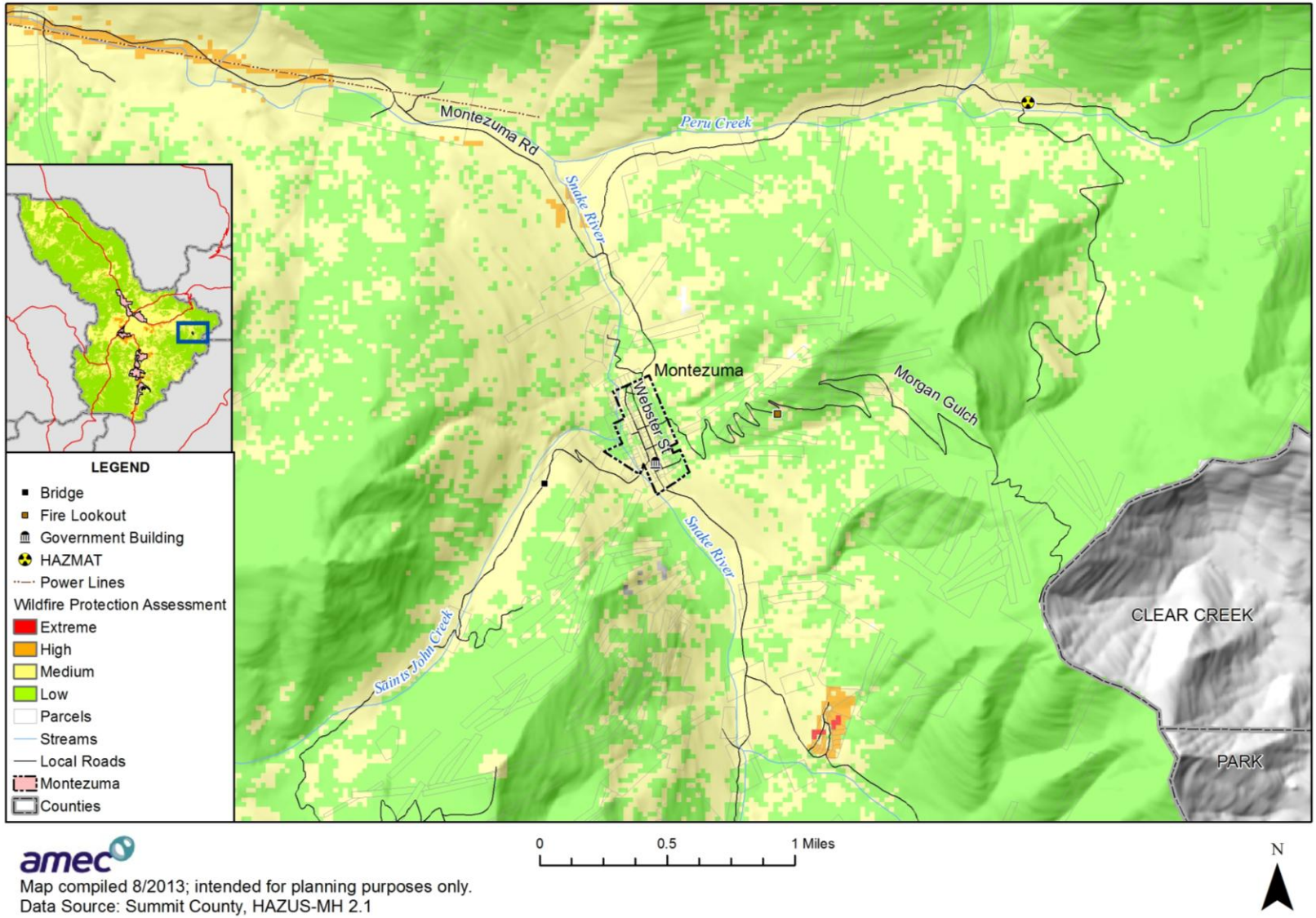
Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard, the property values in Montezuma were separated into wildfire threat zones. The breakdown of property values by wildfire threat zone is shown in Table G.7. Montezuma's wildfire threat zone and critical facilities are shown in Figure G.2.

Table G.7. Montezuma—Property Values in Wildfire Threat Zones

Threat Zone	Land Use	Total Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Low	Residential	17	$2,292,627	$2,826,603	$1,413,302	$4,239,905
Medium	Residential	29	$4,093,964	$6,339,525	$3,169,763	$9,509,288
Totals		**46**	**$6,386,591**	**$9,166,128**	**$4,583,064**	**$13,749,192**

Source: AMEC analysis with County data

Figure G.2. Wildfire Threat and Critical Facilities in Montezuma



amec

Map compiled 8/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

Future Development

The Town of Montezuma does not currently have any development regulations related to wildfire mitigation. The Town is pursuing grant funding to install additional hydrants in 2014. See Montezuma Mitigation Action 1 for further details.

Growth and Development Trends

Table G.8 illustrates how Montezuma has grown in terms of population and number of housing units between 2000 and 2011.

Table G.8. Montezuma—Change in Population and Housing Units, 2000-2011

2000 Population	2011 Population Estimate	Estimated Percent Change 2000-2011	2000 # of Housing Units	2011 Estimated # of Housing Units	Estimated Percent Change 2000-2011
42	77	+83.3	35	47	+34.3

Source: ACS 2011, factfinder2.census.gov

Over the past ten years, Montezuma's permanent resident population has remained small, yet is steadily increasing. The population in 2000 was 42 full-time residents and in 2010 there were 65 full-time residents. The number of full-time residents and part-time residents is equal with approximately 65 of each category. The rate of population change between 2000 and 2010 was 4.5%. The Town is committed to protecting its rural character while still allowing for growth. In 1995 the Town entered into an intergovernmental agreement with Summit County that addresses land use and development within Montezuma's three-mile planning area. While the majority of Montezuma is bordered by White River National Forest public lands, there exists the potential for the future annexation and development of several contiguous parcels of private land into the Town. These parcels are zoned as either Backcountry or Rural Transition, and if annexed would likely be developed at significantly higher densities than allowed under their present County zoning (Town of Montezuma Comprehensive Plan, pg. 10). If Montezuma grows into backcountry areas, wildfire risk may increase.

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 five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, and mitigation outreach and partnerships.

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. Montezuma—Regulatory Mitigation Capabilities

Regulatory Tool (Ordinances, Codes, Plans)	Yes/No	Comments
Master Plan	Yes	Adopted 2013
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	

The Town's 2013 Comprehensive Plan includes goals related to hazard mitigation, including "to protect life and property in Montezuma from environmental and natural hazards." The key strategy is to work with the Summit County Wildfire Council to minimize the potential for wildfire in the Montezuma area. This includes preparing a wildfire evacuation plan for the Town, and adopting, implementing, and updating an emergency preparedness plan. The Town's land use concepts also promote development in ways that minimize risk to hazards.

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—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	No		Summit County

Personnel Resources	Yes/No	Department/Position	Comments
Understanding of Natural Hazards			
Personnel Skilled in GIS	No		Summit County GIS department
Full Time Building Official	No		Summit County Building Department
Floodplain Manager	No		
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)

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—Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	N	
Capital Improvements Project Funding	N	
Authority to Levy Taxes for Specific Purposes	N	
Fees for Water, Sewer, Gas, or Electric Services	N	
Impact Fees for New Development	N	
Incur Debt through General Obligation Bonds	N	
Incur Debt through Special Tax Bonds	N	
Incur Debt through Private Activities	N	
Withhold Spending in Hazard Prone Areas	N	

Mitigation Outreach and Partnerships

The Town of Montezuma has engaged in wildfire specific emergency planning with the Summit County Department of Emergency Management.

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
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:	New in 2013

Mitigation Action: Montezuma—2 Drainage Plan Implementation

Jurisdiction:	Town of Montezuma
Action Title:	Drainage plan implementation
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:	New in 2013

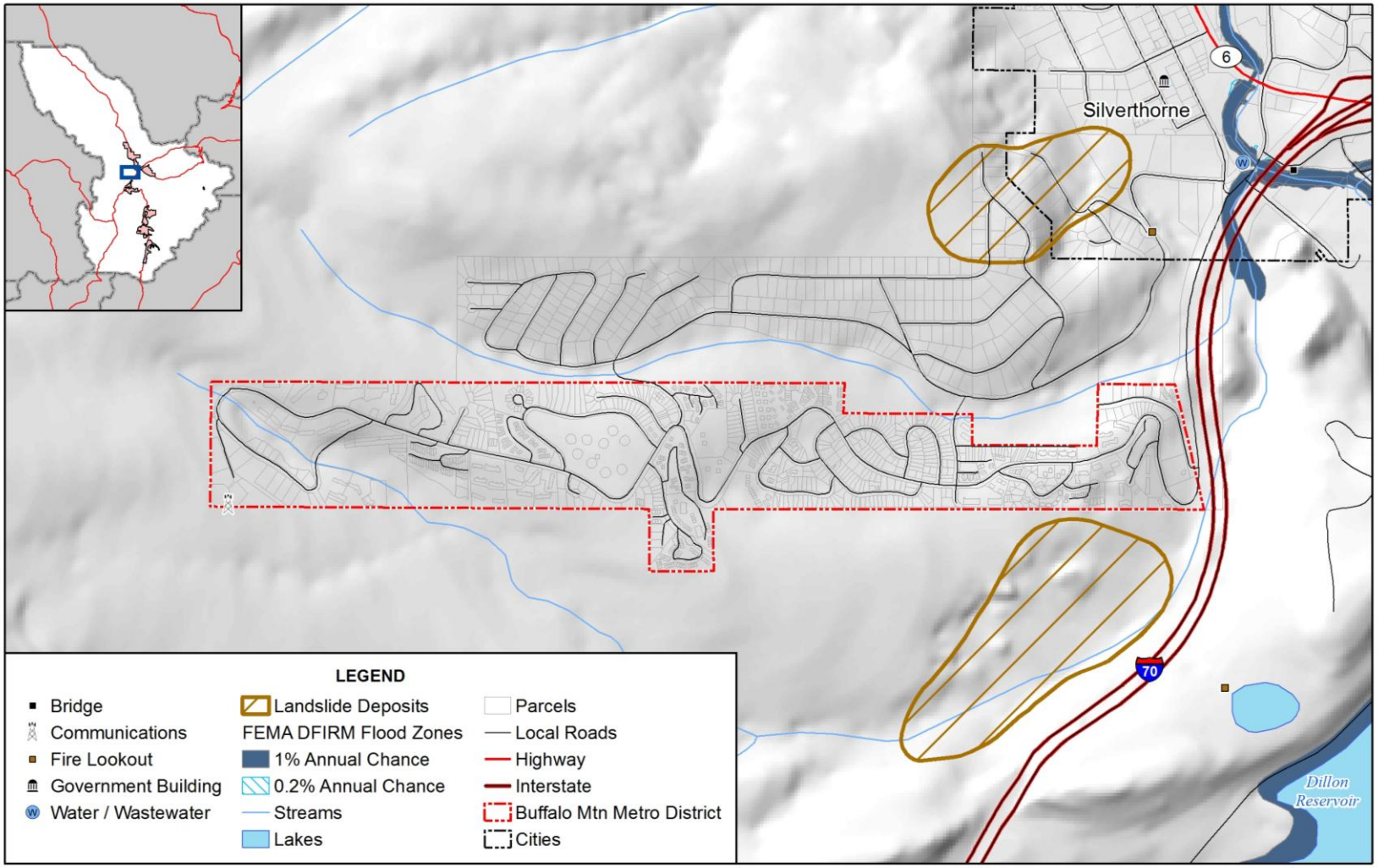
ANNEX H: BUFFALO MOUNTAIN METROPOLITAN DISTRICT

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 approximately 3,000 residential units located on 300 acres. Figure H.1 shows a base map of the Buffalo Mountain Metropolitan District and its location in Summit County. The map also shows critical facilities, flood hazards, and landslide deposits.

Figure H.1. Map of Buffalo Mountain Metropolitan District



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, FEMA DFIRM, Colton/USGS Earth Data Analysis Center

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 Extent*	Probability*	Magnitude*	Hazard Rating
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Failure	Isolated	Unlikely	Limited	Low
Drought	Large	Likely	Limited	Moderate
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, Rock Fall	Small	Occasional	Limited	Low
Lightning	Large	Likely	Limited	Low
Mountain Pine Beetle Infestation	Large	Highly Likely	Limited	Low
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Large	Highly Likely	Critical	High
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 of the main plan.

H.3 Vulnerability Assessment

The intent of this section is to assess the 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 in the main plan. 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 H.2 shows the number of structures, land value, and assessed value of improvements to parcels in Buffalo Mountain Metropolitan District. Land values have been purposely excluded from the Total Value because land remains following disasters, and subsequent market devaluations are frequently short-term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

Table H.2. Buffalo Mountain Metropolitan District—Building Exposure

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improvements Value	Estimated Content Value*	Total Value**
Government	1	0	$0	$0	$0	$0
Mixed Use	79	77	$7,886,131	$182,630,608	$182,630,608	$365,261,216
Open Space	44	11	$89,805	$108,412,157	$108,412,157	$216,824,314
Other	2	1	$0	$17,228,721	$17,228,721	$34,457,442
Residential	813	779	$95,905,357	$250,609,380	$125,304,690	$375,914,070
Total	**939**	**868**	**$103,881,293**	**$558,880,866**	**$433,576,176**	**$992,457,042**

Source: Summit County Assessor 2013
*Content Value estimated; ** Improvements and Contents

Table H.3 lists critical facilities and other community assets identified by the District as important to protect in the event of a disaster.

Table H.3. Buffalo Mountain Metropolitan District—Critical Facilities and Other Community Assets

Name of Asset	Replacement Value ($)	Occupancy/ Capacity #	Hazard Concerns
Water storage and delivery	$9,200,000	2,000,000 gallons/7 miles	Fire, drought, landslide
Sewage collection	$3,700,000	7 miles	Landslide
Roads and walkways	$22,000,000	7 miles/3 miles	Fire and landslide
District Office, maintenance yard and maintenance staff housing	$2,000,000		Drought, Flood

Source: Buffalo Mountain Metropolitan District

Vulnerability by Hazard

This section analyzes existing and future structures and other assets at risk to hazards ranked of moderate or high significance that vary from the risks facing the entire planning area and estimates potential losses. For the District, this only includes wildfire.

Wildfire

Existing Development

A wildfire threat ranking was developed for the Summit County Community Wildfire Protection Plan by the County, fire protection districts, and U.S. Forest Service. It is based on fuel hazards, risk of wildfire occurrence, essential infrastructure at risk, community values at risk, and local preparedness and firefighting capability and classifies the wildfire threat as low, medium, high, and extreme. The wildfire threat GIS layer, updated in 2011, was used to determine the number of acres in each wildfire threat zone and map the wildfire threat in the Buffalo Mountain Metropolitan District (see Table H.4). Figure H.2 shows a map of the wildfire threat ranking in

the Buffalo Mountain Metropolitan District. Figure H.3 shows the wildfire focus areas from the Summit County CWPP and treatment areas.

Table H.4. Buffalo Mountain Metropolitan District—Acreage in Wildfire Threat Zones

Low		Medium		High		Extreme		
Acres	%Total	Acres	%Total	Acres	%Total	Acres	%Total	Total Acres
13	4%	185	63%	95	32%	4	1.4%	**293**

Source: AMEC analysis with County data

Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard, the property values in Buffalo Mountain Metropolitan District were separated into wildfire threat zones, as shown in Table H.5.

Table H.5. Buffalo Mountain Metropolitan District—Property Values in Wildfire Threat Zones

Threat Zone	Land Use	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Low	Mixed Use	3	$229,000	$1,941,942	$1,941,942	$3,883,884
	Open Space	1	$0	$6,218,158	$6,218,158	$12,436,316
	Residential	31	$3,527,046	$7,519,653	$3,759,827	$11,279,480
	Total	**35**	**$3,756,046**	**$15,679,753**	**$11,919,927**	**$27,599,680**
Medium	Mixed Use	48	$4,242,916	$149,492,073	$149,492,073	$298,984,146
	Open Space	8	$81,769	$54,974,799	$54,974,799	$109,949,598
	Residential	500	$55,180,854	$159,555,884	$79,777,942	$239,333,826
	Total	**556**	**$59,505,539**	**$364,022,756**	**$284,244,814**	**$648,267,570**
High	Mixed Use	26	$3,414,215	$31,196,593	$31,196,593	$62,393,186
	Open Space	2	$8,036	$47,219,200	$47,219,200	$94,438,400
	Other	1	$0	$17,228,721	$17,228,721	$34,457,442
	Residential	240	$35,368,916	$80,318,951	$40,159,476	$120,478,427
	Total	**269**	**$38,791,167**	**$175,963,465**	**$135,803,990**	**$311,767,455**
Extreme	Residential	8	$1,828,541	$3,214,892	$1,607,446	$4,822,338
	Total	**8**	**$1,828,541**	**$3,214,892**	**$1,607,446**	**$4,822,338**
Grand Total		**868**	**$103,881,293**	**$558,880,866**	**$433,576,176**	**$992,457,042**

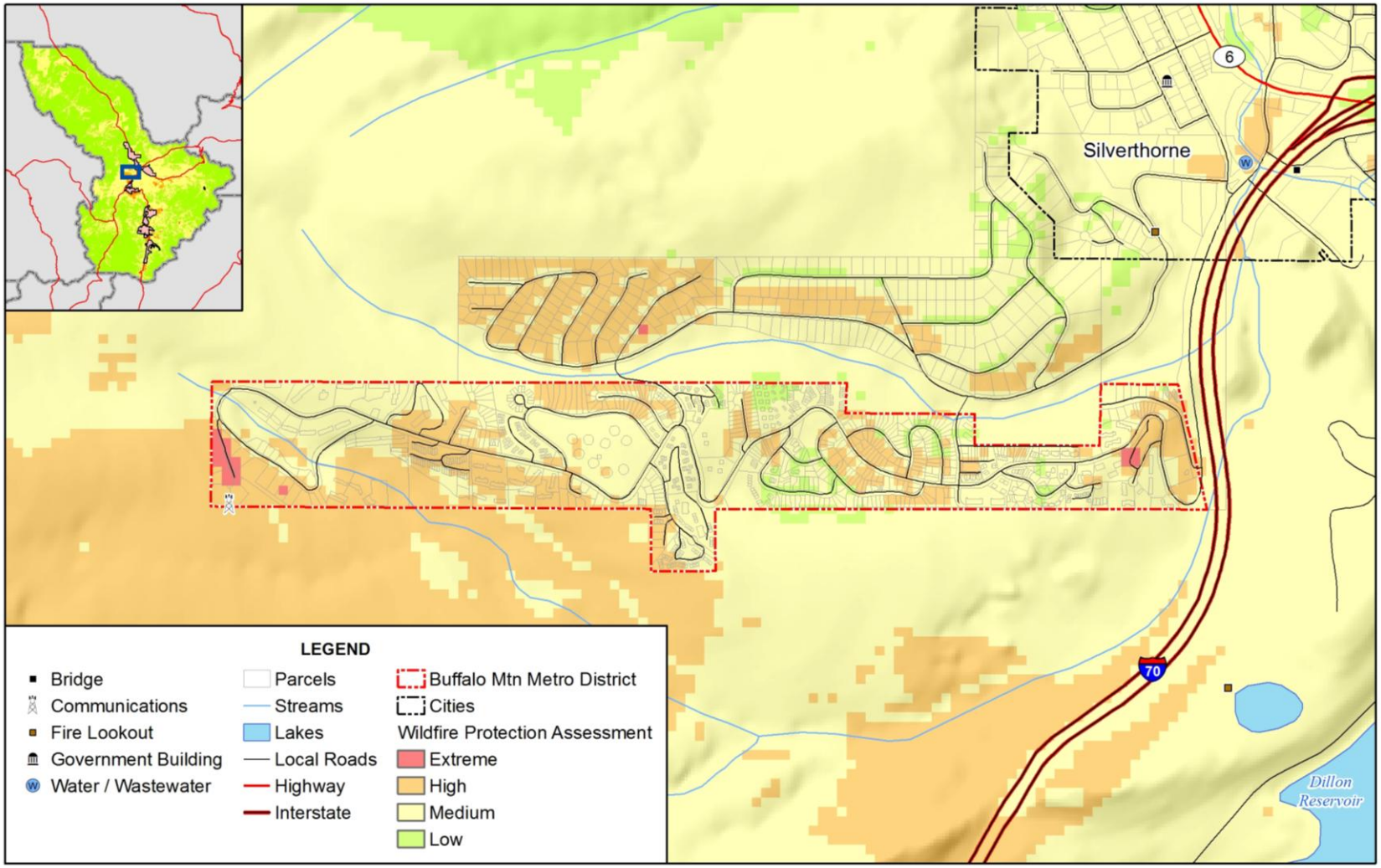
Source: AMEC analysis with County data

Most of the acreage in Buffalo Mountain Metropolitan District is in medium to high wildfire threat zones. These zones have the most property value at risk as well. 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.

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. The District has experienced only a one percent development increase has occurred since 2008. There has been no pressure to develop hazardous areas, including wildfire zones.

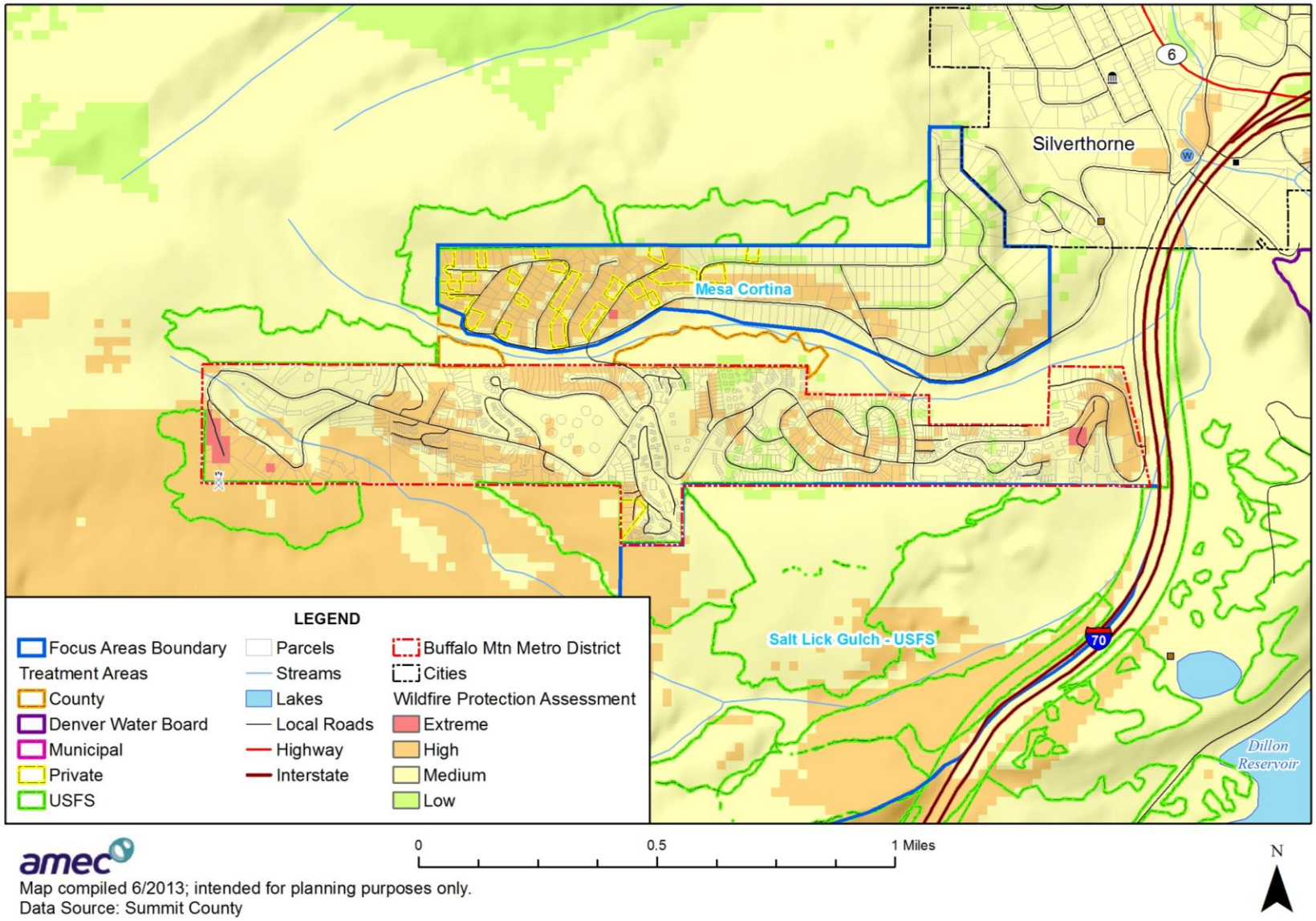
Figure H.2. Buffalo Mountain Metropolitan District Wildfire Threat and Critical Facilities



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

Figure H.3. Buffalo Mountain Metropolitan District Wildfire Focus Areas and Treatment Areas



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County

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 five 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 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.

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. Lake Dillon Fire Protection District 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.

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

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.

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.

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: Create defensible spaces around residential structures within five years.

Status: This Defensible Space Mitigation Action plan has been implemented.

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.

Further, the District has incorporated a landscape maintenance requirement within the District Protective Covenants requiring all property owners to remove dead, dying, diseased, or insect-infested landscape materials as soon as possible after written notice by the Manager of such violation. The Protective Covenants include enforcement and penalty policy for non-compliance.

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.

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: Aerial imagery, data conversion, field verification, and annotation to be completed by 2010.

Status: The Digital Data and Maps Mitigation Action has been implemented.

In early 2010, the District established a digital Geographical Information System (GIS) identifying all assets within the District Boundary.

The District is now able to electronically identify all water, sewer, road, and critical facilities at any given time.

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
Priority:	Low
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:	Complete installation of five backup generators by 2015, subject to funding availability.
Status:	The Backup Power for Critical Facilities Mitigation Action has not been implemented. The cost to purchase, install and maintain five back-up power generators has not been possible due to lack of funding. However, the District has identified five local companies that would rent back-up power generators to the District on an as needed basis.

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
Priority:	High
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:	1-5 years.
Status:	New in 2013

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.
Priority:	High
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:	1-5 years (on-going)
Status:	New in 2013

Mitigation Action: Buffalo Mountain Metropolitan District—6 Source Water Protection Plan

Jurisdiction:	Buffalo Mountain Metropolitan District
Action Title:	Develop Source Water Protection Plan
Priority:	Medium
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:	1-3 years
Status:	New in 2013

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.
Priority:	Medium
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:	On-going
Status:	New in 2013

ANNEX I: FIRE PROTECTION DISTRICTS

I.1 District Profiles

The material presented in this annex applies to two fire protection districts in Summit County, which are described below. Each of the districts participated individually in this planning process. Figures I.1-I.2 show maps of the Districts' boundaries based upon best available data from Summit County GIS. However, these boundaries are not completely accurate, and there are small areas of the County not covered by a fire protection district. The base maps also show critical facilities, DFIRM, and landslide deposits.

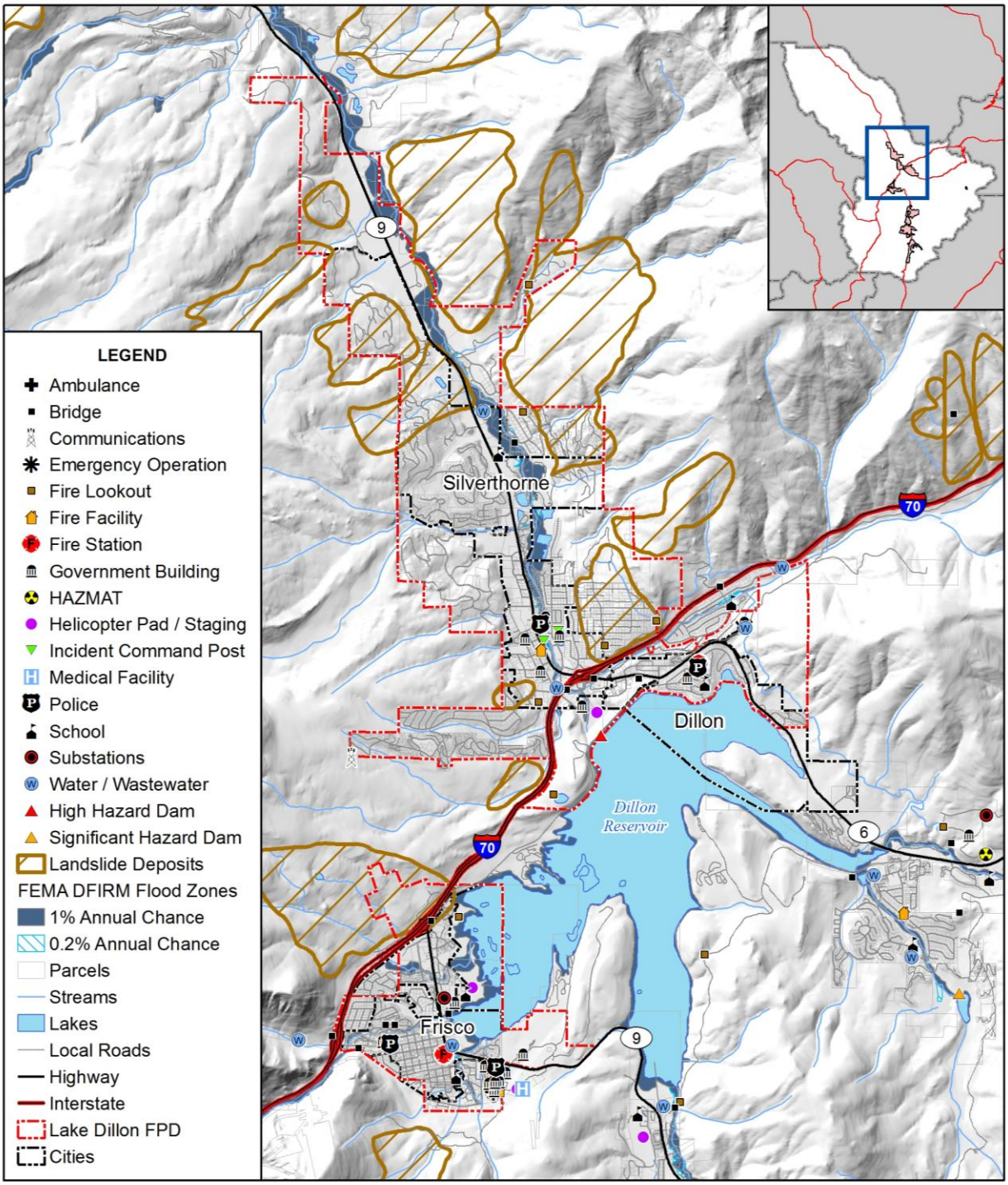
Lake Dillon Fire Protection District

The Lake Dillon Fire Protection District, also known as Lake Dillon Fire Rescue, is funded by taxpayers through their property tax. It is a career department with 46 firefighters, 9 civilian staff positions, three 24-hour stations, and two reserve stations covering Frisco, Silverthorne, Dillon, Keystone, and Montezuma. The Lake Dillon Fire Protection District is the successful consolidation of five former fire districts. It has a response area of 310 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 20 miles of the highest stretch of Interstate 70 in the United States. The ski resorts of Arapahoe Basin and Keystone are also included in the protection area. Protected municipalities include Dillon, Frisco, and Silverthorne as well as 12 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, as it is called today. The District covers approximately 140 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 50 paid personnel in 4 divisions: Operations, Administration, Community Risk Management, and Training, Health, and Safety.

Figure I.1. Map of Lake Dillon Fire Protection District

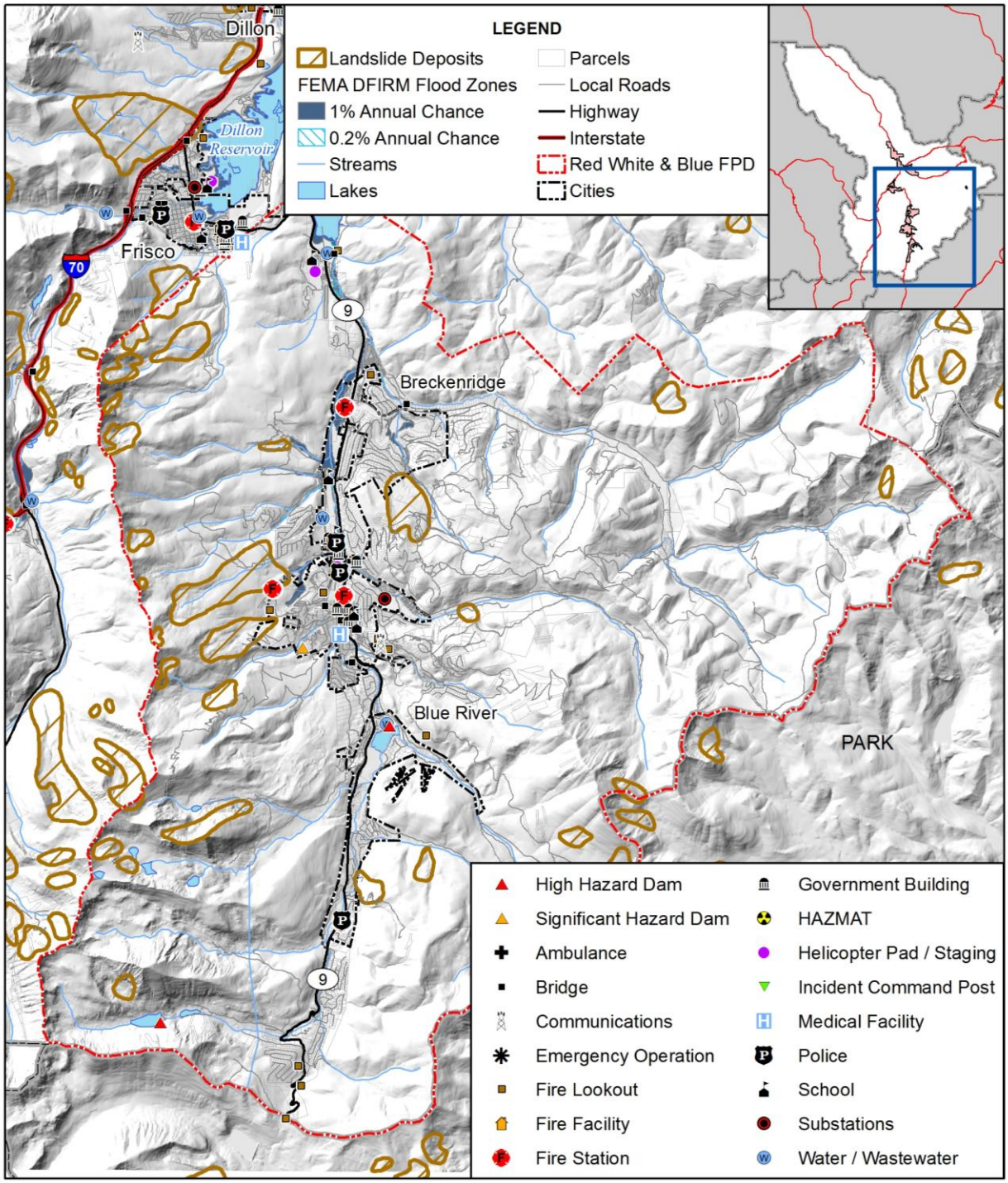


amec

0 1.5 3 Miles

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, FEMA DFIRM, Colton/USGS Earth Data Analysis Center

Figure I.2. Map of Red, White, and Blue Fire Protection District



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, FEMA DFIRM, Colton/USGS Earth Data Analysis Center

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 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 Extent*	Probability*	Magnitude*	Hazard Rating
Avalanche	Isolated	Highly Likely	Limited	Low
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
Hailstorm	Small	Likely	Negligible	Low
Hazardous Materials Release (Transportation)	Isolated	Highly Likely	Critical	Moderate
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Likely	Critical	Moderate
Lightning	Large	Highly Likely	Critical	Moderate
Mountain Pine Beetle Infestation	Large	Likely	Critical	Moderate
Severe Winter Weather	Large	Likely	Limited	Moderate
Tornado	Isolated	Unlikely	Catastrophic	Low
Wildfire	Large	Highly Likely	Catastrophic	High
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 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 hazard that varies from other parts of the planning area, 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 number of structures, land value, and assessed value of improvements to parcels in the two fire protections districts. Land values have been purposely excluded from the Total Value because land remains following disasters, and subsequent market devaluations are frequently short-term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

Table I.2. LDFPD and RWBFPD—Building Exposure

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improvements Value	Estimated Content Value*	Total Value**
Lake Dillon Fire Protection District						
Commercial	363	257	$151,951,009	$188,552,502	$188,552,502	$377,105,004
Government	163	28	$6,838,193	$32,393,187	$32,393,187	$64,786,374
Industrial	17	17	$8,231,159	$5,494,808	$5,494,808	$10,989,616
Mixed Use	207	175	$48,418,453	$281,915,117	$281,915,117	$563,830,234
Open Space	202	16	$537,086	$114,857,046	$114,857,046	$229,714,092
Residential	22	6	$985,941	$18,336,859	$18,336,859	$36,673,718
Total	**5,618**	**4,957**	**$993,275,467**	**$2,473,751,073**	**$1,236,875,537**	**$3,710,626,610**
Red, White, and Blue Fire Protection District						
Backcountry	236	9	$4,335,980	$722,297	$722,297	$1,444,594
Commercial	215	142	$113,385,684	$115,245,811	$115,245,811	$230,491,622
Government	72	3	$395,085	$14,750,026	$14,750,026	$29,500,052
Industrial	43	24	$11,836,887	$23,641,022	$35,461,533	$59,102,555
Mixed Use	177	89	$50,059,513	$291,384,672	$291,384,672	$582,769,344
Open Space	126	1	$1,025,311	$86,999	$86,999	$173,998
Residential	321	24	$19,342,922	$125,061,159	$125,061,159	$250,122,318
Total	**7,745**	**5,909**	**$1,843,017,340**	**$4,267,020,177**	**$2,133,510,089**	**$6,400,530,266**
Grand Total	**13,363**	**10,866**	**$2,836,292,807**	**$6,740,771,250**	**$3,370,385,626**	**$10,111,156,876**

Source: Summit County Assessor 2013
*Content Value estimated; ** Improvements and Contents

Table I.3 lists critical facilities and other community assets identified by the Lake Dillon Fire Protection District as important to protect in the event of a disaster. The Red, White, and Blue Fire Protection Districts identified facilities are listed in Table I.4.

Table I.3. Lake Dillon Fire Protection District—Critical Facilities and Other Community Assets

Name of Asset	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Issues
Lake Dillon Fire Protection District Station 2 – Frisco	5.5 million	Fire Station and Fire Prevention Offices/ Occupancy 20	
Lake Dillon Fire Protection District Station 8 – Dillon	4.5 million	Fire Station/ Occupancy 13	
Lake Dillon Fire Protection District Station 10 – Silverthorne	3.5 million	District Administrative. Offices/ Occupancy 30	
Lake Dillon Fire Protection District Station 11 – Keystone	5.5 million	Fire Station and Support and Fleet Services/Occupancy 50	
Lake Dillon Fire Protection District Station 12 – Summit Cove	2.5 million		Not staffed
Lake Dillon Fire Protection District Station 14 – Wildernest	2.0 million		Not staffed
Employee Housing Building – Dillon Valley	1.0 million		
Other Community Assets			
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			
Xcel Energy Regional Service Facility and Substations			
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			Shelter Location
Frisco Elementary School			
Dillon Valley Elementary School			
Silverthorne Elementary School			

Name of Asset	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Issues
Summit Cove Elementary School			
Summit County 9-1-1 Communications			
Summit County Ambulance Headquarters			

Source: Lake Dillon Fire Protection District

Table I.4. Red, White, and Blue Fire Protection District—Critical Facilities and Other Community Assets

Name of Asset	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Issues
Fire Station 4	3.3 Million	Fire Station and Community Rooms/ Occupancy 50	
Fire Station 6	4.6 Million	Fire Station and Administrative Offices/ Occupancy 50	
Fire Sub-station Breckenridge	1 Million	Fire Substation/Occupancy 10	Fire Station is part of Grand Lodge Peak 7 Hotel North Building.
Fire Station 7	1.5 Million	Fire Station/Occupancy 10	
Town of Breckenridge Town Hall			
Town of Blue River Town Hall			
Summit County Justice Center			
Breckenridge Police Station			
Old County Court House			
Town of Breckenridge Public Works			
Breckenridge Ski Resort Lifts and Buildings			
Breckenridge Medical Center			
High Country Health Care			
Town of Breckenridge Recreation Center			Shelter Location
Town of Breckenridge Water Treatment Plant			
Upper Blue Sanitation District Facilities (Blue River, Iowa Hill & Farmers Korner)			
Century Link Breckenridge Office			Main phone service building. Also a Tier II facility.
Xcel Energy Gas Buildings			
Colorado Natural Gas Meter Station			
Xcel Substation			Power substation facility on Wellington Road

Name of Asset	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Issues
Blue Lakes Dam			At the start of the Blue River
Goose Pasture Tarn Dam			Town of Breckenridge water supply
Carriage House Day Care			
Little Red School House			
Timberline Learning Center			
Upper Blue Elementary School			
Breckenridge Elementary School			
Summit High School			
Colorado Mountain College			
Ski Area Maintenance			Tier II Facility
Grand Lodge Peak 7			Fire Department sub-station located in basement of building.
Ferrellgas Breckenridge			Tier II Facility
Alpine Rock			Tier II Facility
Four Mile Bridge			HWY 9 Bridge by Gold Hill. Bridge has safety issues as identified by CDOT. Could hamper egress.

Source: Red, White, and Blue Fire Protection District

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 Lake Dillon Fire Protection District 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).

According to the Colorado Department of Transportation, traffic on Interstate 70 through the Lake Dillon Fire Protection District has increased by a factor of three over the past decade. Due to its unique location, Lake Dillon Fire Protection District, 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. Human-caused disasters such as hazardous materials, bioterrorism, or explosions will also isolate the

Lake Dillon Fire Protection District and other areas of Summit County. This may serve as an impediment for receiving aid from outside the County for a period of time.

For RWBFPD, the protection of the Goose Pasture Tarn is a critical watershed for fire protection and drinking water supplies for the Town of Breckenridge and surrounding areas. The District is geographically isolated much like LDFPD 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 ranked of moderate or high significance that vary from the risks facing the entire planning area and estimates potential losses. For the Districts' purposes, wildfire is the hazard that varies from other parts of the planning area, and for which the Districts have responsibility.

Wildfire

Existing Development

A wildfire threat ranking was developed for the Summit County Community Wildfire Protection Plan by the County, fire protection districts, and U.S. Forest Service. It is based on fuel hazards, risk of wildfire occurrence, essential infrastructure at risk, community values at risk, and local preparedness and firefighting capability and classifies the wildfire threat as low, medium, high, and extreme. The wildfire threat GIS layer, updated in 2011, was used to determine the number of acres in each wildfire threat zone and to map the wildfire threat in each of the fire protection districts (see Table I.5).

Table I.5. Acreage in Wildfire Threat Zones by District

	Low		Medium		High		Extreme		
Jurisdiction	Acres	% Total	Acres	% Total	Acres	% Total	Acres	% Total	Total Acres
Lake Dillon FPD	601,931	76%	178,132	23%	6,976	0.9%	173	0.02%	787,213
Red, White, and Blue FPD	253,995	76%	78,107	23%	3,807	1.1%	154	0.05%	336,064

Source: AMEC analysis with County data

Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard, the property values in the Districts were separated into wildfire threat zones. The breakdown of property values in each District by wildfire threat zone is shown in Table I.6. Figures I.3 and I.4 show the wildfire threat areas in LDFPD and RWBFPD, respectively. Figures I.5 and I.6 show the wildfire focus areas from the County CWPP and treatment areas in the two fire protection districts.

Table I.6. Property in Wildfire Threat Zones by District

Threat Zone	Land Use	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Lake Dillon Fire Protection District						
Low	Commercial	78	$17,062,267	$23,694,174	$23,694,174	$47,388,348
	Industrial	1	$632,089	$73,880	$110,820	$184,700
	Mixed Use	6	$404,757	$2,198,597	$2,198,597	$4,397,194
	Open Space	2	$87,187	$6,309,430	$6,309,430	$12,618,860
	Residential	939	$213,398,201	$407,370,719	$203,685,360	$611,056,079
	Total	**1,026**	**$231,584,501**	**$439,646,800**	**$235,998,381**	**$675,645,181**
Medium	Commercial	157	$112,605,116	$144,478,464	$144,478,464	$288,956,928
	Government	25	$6,590,555	$28,549,510	$28,549,510	$57,099,020
	Industrial	15	$6,089,336	$4,457,513	$6,686,270	$11,143,783
	Mixed Use	90	$13,999,443	$196,132,960	$196,132,960	$392,265,920
	Open Space	11	$384,877	$61,327,889	$61,327,889	$122,655,778
	Other	5	$919,137	$1,108,138	$1,108,138	$2,216,276
	Residential	3,205	$593,422,039	$1,656,614,765	$828,307,383	$2,484,922,148
	Total	**3,508**	**$734,010,503**	**$2,092,669,239**	**$1,266,590,613**	**$3,359,259,852**
High	Commercial	21	$18,505,882	$19,984,534	$19,984,534	$39,969,068
	Government	2	$247,638	$29,747	$29,747	$59,494
	Industrial	1	$1,509,734	$963,415	$1,445,123	$2,408,538
	Mixed Use	78	$33,133,468	$83,574,841	$83,574,841	$167,149,682
	Open Space	2	$61,264	$47,219,200	$47,219,200	$94,438,400
	Other	1	$0	$17,228,721	$17,228,721	$34,457,442
	Residential	781	$177,872,489	$402,079,927	$201,039,964	$603,119,891
	Total	**886**	**$231,330,475**	**$571,080,385**	**$370,522,129**	**$941,602,514**
Extreme	Commercial	1	$3,777,744	$395,330	$395,330	$790,660
	Government	1	$0	$3,813,930	$3,813,930	$7,627,860
	Mixed Use	1	$880,785	$8,719	$8,719	$17,438
	Open Space	1	$3,758	$527	$527	$1,054
	Residential	32	$8,582,738	$7,685,662	$3,842,831	$11,528,493
	Total	**36**	**$13,245,025**	**$11,904,168**	**$8,061,337**	**$19,965,505**
Totals		**5,456**	**$1,210,170,504**	**$3,115,300,592**	**$1,881,172,460**	**$4,996,473,052**
Red, White, and Blue Fire Protection District						
Low	Backcountry	1	$1,219,524	$319	$319	$638
	Commercial	2	$2,677,165	$1,200,761	$1,200,761	$2,401,522
	Mixed Use	11	$5,263,411	$4,340,535	$4,340,535	$8,681,070
	Open Space	1	$0	$86,999	$86,999	$173,998
	Other	1	$758,230	$747	$747	$1,494
	Residential	572	$197,142,894	$304,755,207	$304,755,207	$609,510,414
	Total	**588**	**$207,061,224**	**$310,384,568**	**$310,384,568**	**$620,769,136**
Medium	Backcountry	8	$2,894,427	$721,978	$721,978	$1,443,956
	Commercial	137	$110,208,704	$113,396,614	$113,396,614	$226,793,228
	Government	1	$51,950	$632,820	$632,820	$1,265,640
	Industrial	21	$10,358,512	$23,092,553	$34,638,830	$57,731,383
	Mixed Use	74	$41,071,098	$254,088,074	$254,088,074	$508,176,148

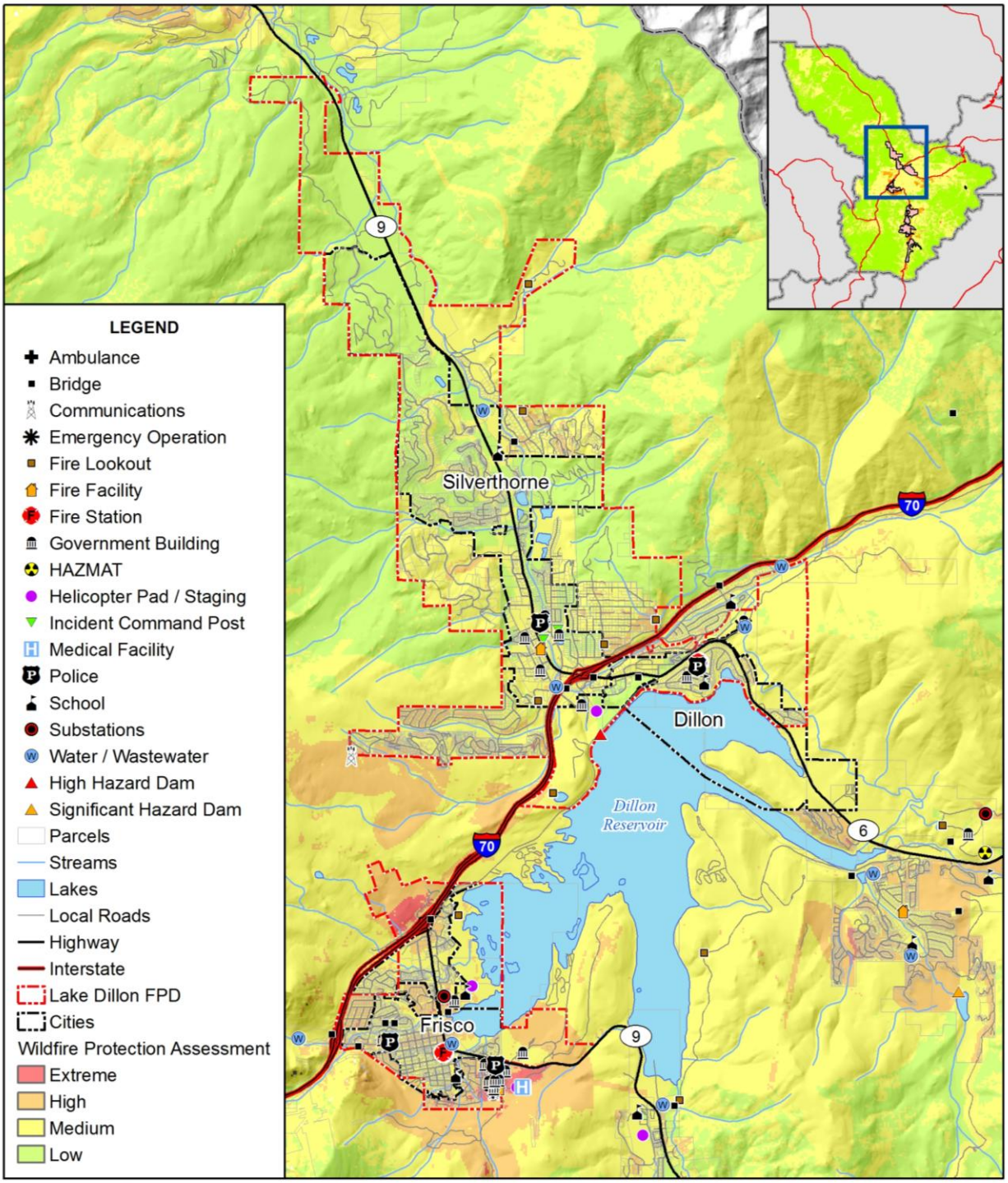
Threat Zone	Land Use	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
	Other	21	$16,668,949	$123,482,572	$123,482,572	$246,965,144
	Residential	3,942	$1,252,781,359	$3,319,917,079	$3,319,917,079	$6,639,834,158
	Total	**4,204**	**$1,434,034,999**	**$3,835,331,690**	**$3,846,877,967**	**$7,682,209,657**
High	Commercial	3	$499,815	$648,436	$648,436	$1,296,872
	Industrial	3	$1,478,375	$548,469	$822,704	$1,371,173
	Mixed Use	4	$3,725,004	$32,956,063	$32,956,063	$65,912,126
	Other	2	$1,915,743	$1,577,840	$1,577,840	$3,155,680
	Residential	1,359	$383,114,272	$623,727,829	$311,863,915	$935,591,744
	Total	**1,371**	**$390,733,209**	**$659,458,637**	**$347,868,957**	**$1,007,327,594**
Extreme	Government	2	$343,135	$14,117,206	$14,117,206	$28,234,412
	Residential	36	$9,978,815	$18,620,062	$9,310,031	$27,930,093
	Total	**38**	**$10,321,950**	**$32,737,268**	**$23,427,237**	**$56,164,505**
Totals		**6,201**	**$2,042,151,382**	**$4,837,912,163**	**$4,528,558,729**	**$9,366,470,892**
Grand Total		**10,405**	**$3,476,186,381**	**$8,673,243,853**	**$8,375,436,696**	**$17,048,680,549**

Source: AMEC analysis with County data

The Lake Dillon Fire Protection District has the most acreage at risk (7,149 acres) in high and extreme wildfire threat zones, but the Red, White, and Blue Fire Protection District has a greater percentage of their district (1.15 percent) in high and extreme wildfire threat zones. RWBFPD has more total property value in high and extreme wildfire threat areas (more than $56 million in the extreme wildfire threat zone alone).

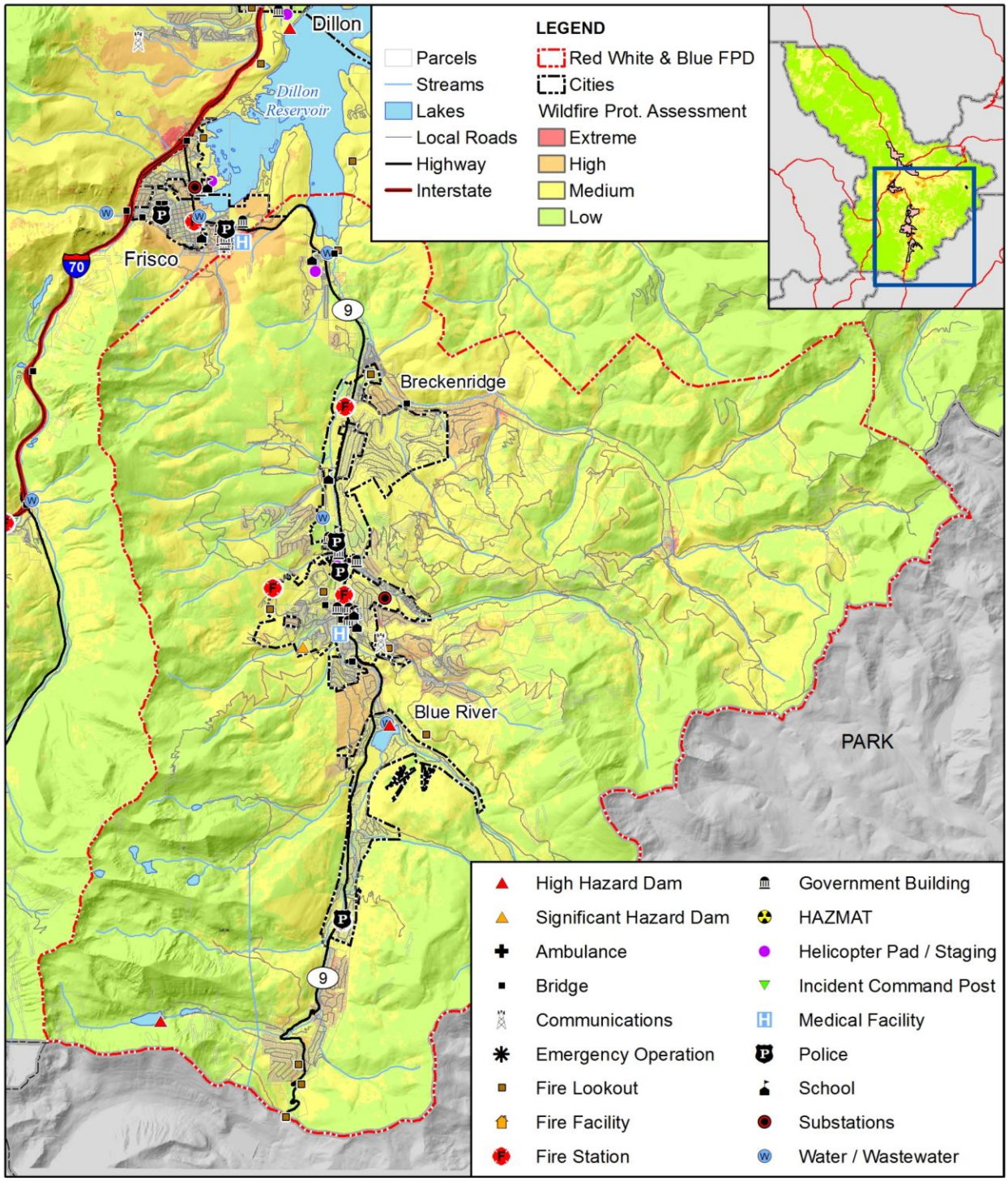
Lake Dillon FPD has 11 critical facilities located in the extreme fire threat zone and 22 critical facilities located in the high wildfire threat zone. RWBFPD has two critical facilities in the high fire threat zone and none in the extreme wildfire threat zone.

Figure I.3. Wildfire Threat and Critical Facilities in LDFPD



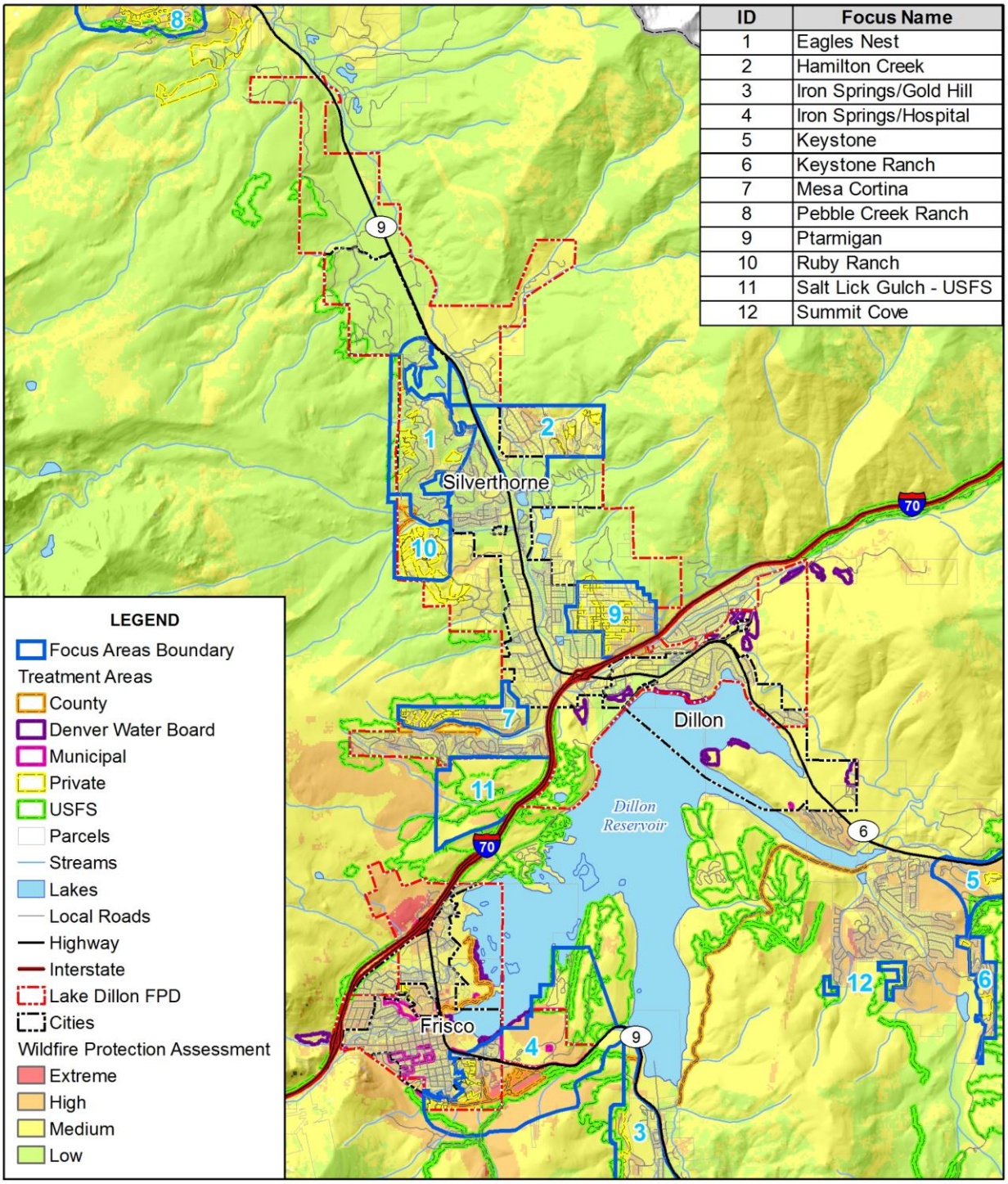
Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

Figure I.4. Wildfire Threat and Critical Facilities in RWBFPD



Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

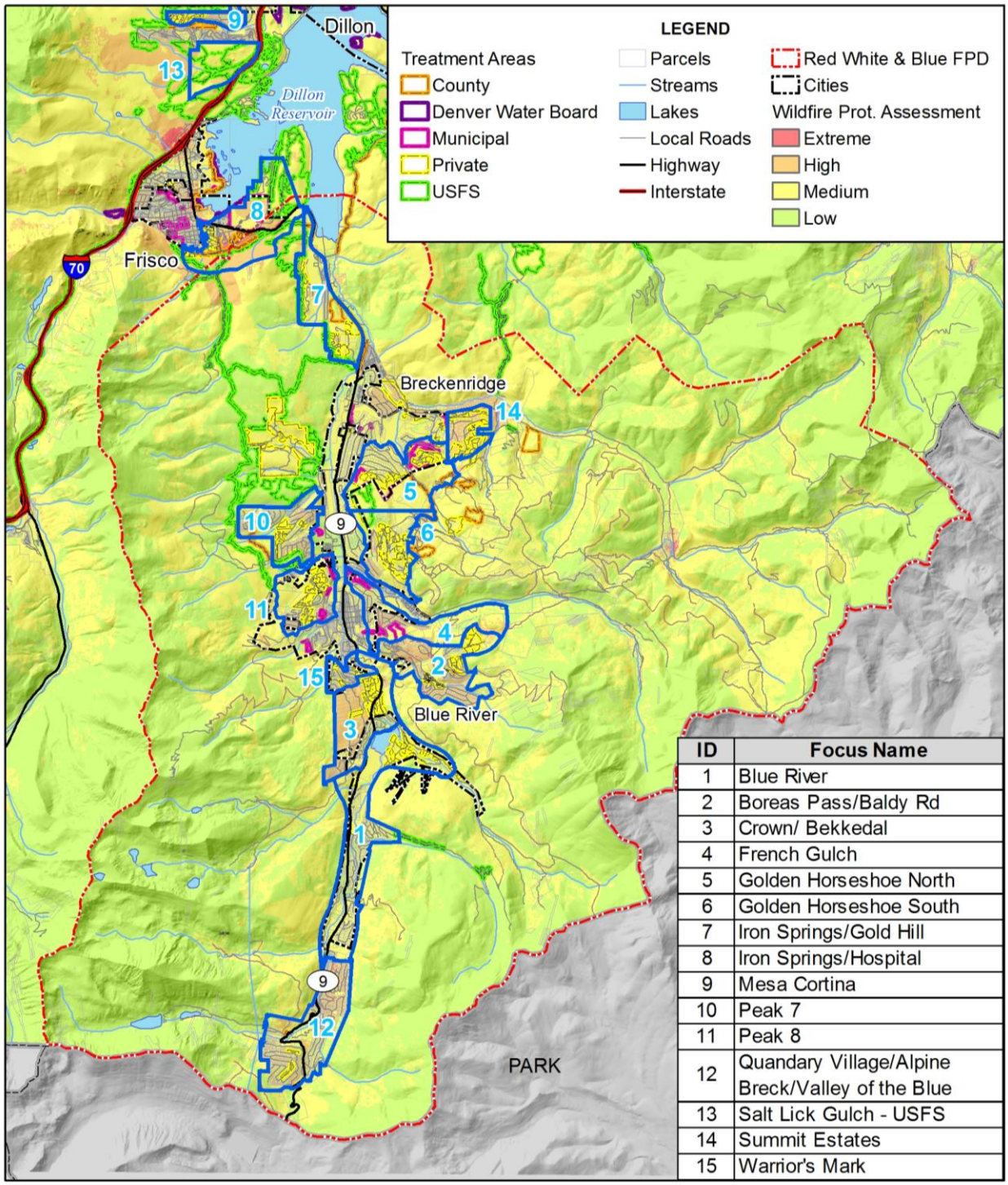
Figure I.5. Wildfire Focus Areas and Treatment Areas in LDFPD



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County

Figure I.6. Wildfire Focus Areas and Treatment Areas in RWBFPD



ID	Focus Name
1	Blue River
2	Boreas Pass/Baldy Rd
3	Crown/ Bekkedal
4	French Gulch
5	Golden Horseshoe North
6	Golden Horseshoe South
7	Iron Springs/Gold Hill
8	Iron Springs/Hospital
9	Mesa Cortina
10	Peak 7
11	Peak 8
12	Quandary Village/Alpine Breck/Valley of the Blue
13	Salt Lick Gulch - USFS
14	Summit Estates
15	Warrior's Mark

amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County

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 the 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

The Districts are also affected by other hazards that exacerbate wildfire hazard conditions, such as drought, lightning, and windstorms. In addition, lands damaged by wildfire are subject to increased runoff and erosion as well as landslides, mudslides/debris flows, and rock fall.

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 five 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 and the Fire Hazard Mitigation Amendment adopted by Summit County as an amendment to the International Building Code. The fire districts enforce Chapter 45 of the International Residential Code as well as the International Fire Code. The 2012 International Fire Code is scheduled for adoption in the early summer of 2013. The fire districts also support programs such as Firewise and Ready, Set, Go. RWBFPD and LDFPD both have capital improvement plans for their facilities and apparatus as part of their Strategic Plans.

The Lake Dillon Fire Protection District Service Plan was updated and adopted in 2006. The District performs site plan reviews for local jurisdictions. The District has an Insurance Services Office (ISO) rating of four for the Towns of Dillon and Silverthorne, a class five in the Town of Frisco and unincorporated areas of the district, and a nine in Montezuma and Arapahoe Basin.

The Red, White, and Blue Fire Protection District participates in the annual wildfire operating plan. The District enforces the 2012 International Fire Code as amended by Summit County and performs site plan review requirements for emergency access and water supply. The District has an ISO rating of four in all areas serviced by a water system, and nine in all other 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. LDFPD has two IT support specialists in the Support Services Division skilled in GIS. The LDFPD 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 also trained in construction practices related to buildings and infrastructure. Each district has its own grant writing capabilities and both are career fire departments with approximately 50 people on staff.

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:

Lake Dillon Fire Protection District

- 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. LDFPD held over 25 meetings with HOA groups to discuss/educate on wildfire issues.
- Maintains a proactive public information office staffed by a full-time public affairs officer to keep educational fire safety information, public awareness of fire district activities, and active participation in community events promoting fire safety.
- Manages the fire hazard mitigation program for the County and the Summit Fire Authority that utilizes strategies similar to the Firewise Communities program.
- Instrumental in planning and organizing the Summit County Incident Management Team in 1996.
- 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 department.
- Currently participating in the effort to improve and upgrade security and emergency response capacity to the Colorado Department of Transportation managed 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 training, equipment, and administrative assistance between the two departments.
- LDFPD participated in the development of a Community Wildfire Protection Plan (CWPP).

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.

- In June of 2012, RWBFPD hosted a countywide Ready, Set, Go workshop in conjunction with the local Red Cross, State Forest Service, Law Enforcement, Fire Districts, and CSU Extension. Another workshop was held in the fall. Funding for the original workshop was obtained through a Ready, Set, Go grant through the International Association of Fire Chiefs. Another grant has been awarded for 2013 with another workshop planned for June 1, 2013.
- RWBFPD participated in the development of a Community Wildfire Protection Plan (CWPP) and the formation of defensible space requirements in the Town of Breckenridge.

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: Lake Dillon Fire Protection District—1 Wildfire Mitigation Program

Jurisdiction:	Lake Dillon Fire Protection District
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:	Apply for funding to maintain and enhance via code enforcement and public education a wildfire mitigation office for Lake Dillon Fire Protection District and expand the process to include all of Summit County including all municipalities. Current funding of the existing one person wildfire mitigation office is not present for the entire year of 2009. The continuation and expansion of this critical office is one of the highest priorities of Summit County and Lake Dillon Fire Protection District.
Responsible Agency:	Lake Dillon Fire Protection District
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:	U.S. Forest Service, Colorado State Forest Service, 50 percent cash match possible via Summit Fire Authority and Summit County Government
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:	Ready to implement immediately upon acquiring funding
Status:	Deferred. This has not been implemented due to restructuring and re-assigning the management of the fire mitigation program responsibilities to the respective fire prevention divisions within the two fire districts and the Copper Mountain CMD. To facilitate enforcement of the fire mitigation code amendment to the International Building Code, each district signed an intergovernmental agreement in 2010 with Summit County Government.

Mitigation Action: Lake Dillon Fire Protection District—2 Emergency Generators

Jurisdiction:	Lake Dillon Fire Protection District
Action Title:	Install emergency generators in three fire stations
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 three back-up generators for fire stations 2, 8, and 11.
Responsible Agency:	Lake Dillon Fire Protection District
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:	$225,000
Benefits: (Losses Avoided)	The ability to operate out of the three 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 2009 if funding acquired
Status:	Ongoing. An external natural gas-fueled generator was installed in 2011 and is operational at Station 11 in Keystone. Budgeting for generators at Stations 2 (Frisco) and 8 (Dillon) are included in the five year capital plan contingent upon available funding.

Mitigation Action: Lake Dillon Fire Protection District—3 Rural Addressing

Jurisdiction:	Lake Dillon Fire Protection District
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:	Lake Dillon Fire Protection District Captain Kim McDonald, 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:	2013-2015
Status:	New in 2013

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
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 Lake Dillon Fire Rescue
Potential Funding:	Budgeted and grant funding
Cost Estimate:	$40,000
Benefits: (Losses Avoided)	Reduces property loss during wildfire events
Timeline:	2009–2013
Status:	Completed/ongoing. This goal has been achieved as far as creating public education programs. We continue to enhance this goal by utilizing the Firewise communities program to further grow the educational program.

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

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: 2009–2013

Status: Completed. This goal has been achieved through our Ready, Set, Go program and focuses not only on winter preparedness but all-hazard preparedness.

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
Priority:	Medium
Background/Issue:	Backup power is needed for critical facilities.
Ideas for Implementation:	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:	2009–2013
Status:	Deferred. This goal has not been achieved. In 2012 RWB applied for grant funds through the Fire Act and was not awarded moneys for this project. This project has been identified in our long-range capital expenditures over the next 5 years.

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
Priority:	Medium
Background/Issue:	Evacuation drills are needed to practice and refine procedures.
Ideas for Implementation:	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:	2009–2013
Status:	Ongoing. This goal has been partially completed. In 2012 crew training placed our crews in one neighborhood for wildfire evacuation and planning training. The HOA participated in the evacuation piece, but this was limited to one HOA. We continue to work with our HOA's to provide evacuation drills to them during HOA talks. A full scale or larger area drill needs to still be conducted.

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
Priority:	Low
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., bodyshops, 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:	Deferred. This has not been implemented. The research for building of this GIS layer has not fully been completed. A change in management took away from project focuses that are now being focused on again.

Mitigation Action: Red, White, and Blue Fire District—6 Rural Addressing

Jurisdiction:	Red, White, and Blue Fire District
Action Title:	Rural addressing
Priority:	High
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:	New in 2013

Mitigation Action: Red, White, and Blue Fire District—7 Firewise Communities Program

Jurisdiction:	Red, White, and Blue Fire District
Action Title:	Firewise communities program
Priority:	High
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:	New in 2013

ANNEX J: COPPER MOUNTAIN CONSOLIDATED METROPOLITAN DISTRICT

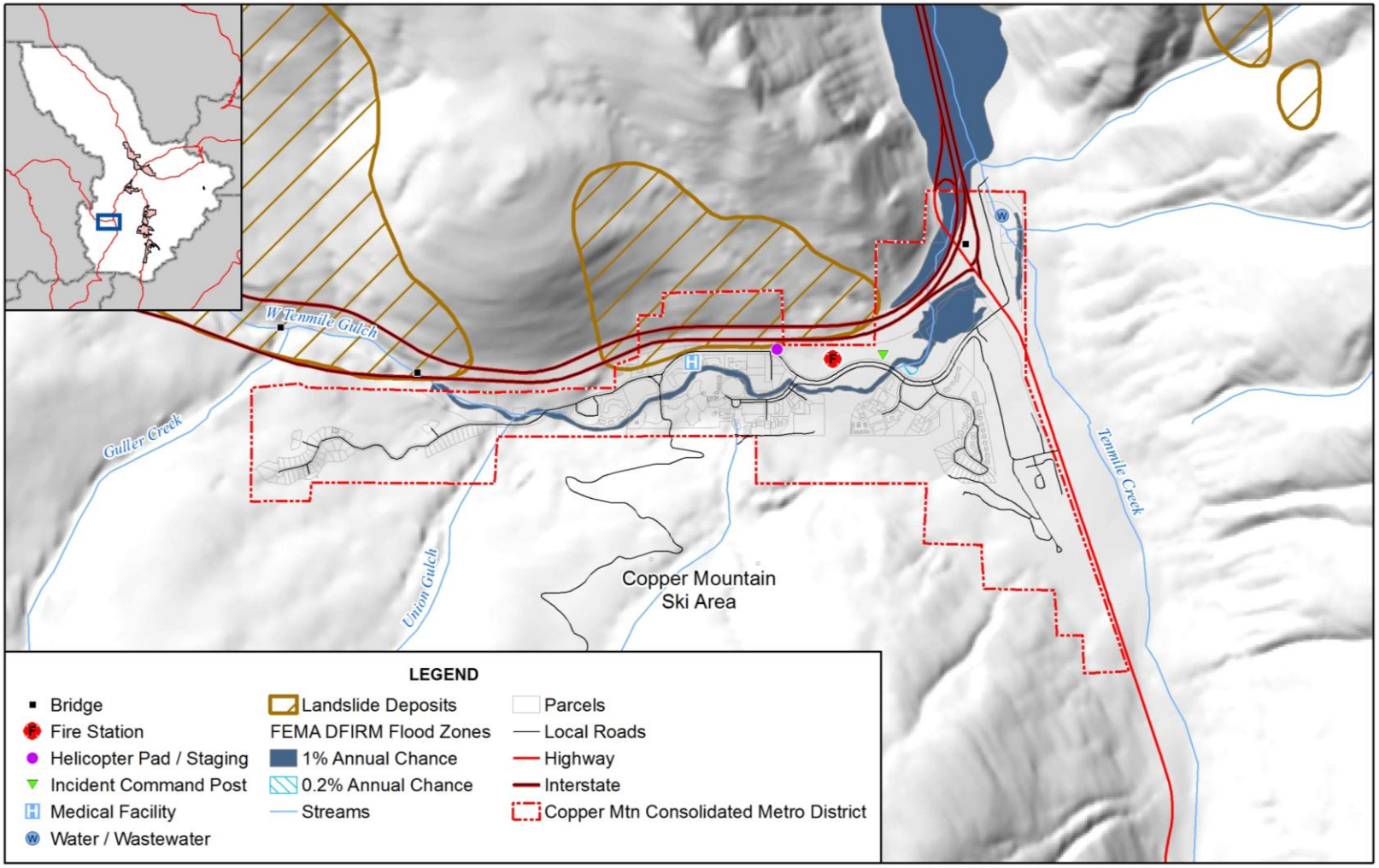
J.1 Community Profile

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, emergency services (including wildfire response), television, parks, and streets. 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 a map of CMCMD and its location within Summit County. The map also shows critical facilities, DFIRM, and landslide deposits.

Figure J.1. Map of CMCMD and Critical Facilities



amec

0 0.5 1 Miles

N

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, FEMA DFIRM,
Colton/USGS Earth Data Analysis Center

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 Town (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*	Magnitude*	Hazard Rating
Avalanche	Isolated	Highly likely	Limited	High
Dam Failure	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	Isolated	Likely	Critical	High
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Likely	Negligible	Medium
Lightning	Large	Highly Likely	Critical	High
Mountain Pine Beetle Infestation	Large	Highly Likely	Limited	High
Severe Winter Weather	Large	Highly Likely	Critical	High
Wildfire	Large	Highly Likely	Catastrophic	High
Windstorm	Large	Highly Likely	Critical	High

*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.

J.3 Vulnerability Assessment

The intent of this section is to assess CMCMD'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.

District Asset Inventory

Table J.2 shows the number of structures, land value, and assessed value of improvements to parcels in CMCMD. Land values have been purposely excluded from the Total Value because land remains following disasters, and subsequent market devaluations are frequently short-term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

Table J.2. CMCMD—Building Exposure

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improvements Value	Estimated Content Value*	Total Value**
Commercial	3	1	$1,022,023	$564,272	$564,272	$1,128,544
Mixed Use	233	159	$64,902,091	$550,574,600	$550,574,600	$1,101,149,200
Open Space	13	3	$7,013,874	$1,734,869	$1,734,869	$3,469,738
Total	**249**	**163**	**$72,937,988**	**$552,873,741**	**$552,873,741**	**$1,105,747,482**

Source: Summit County Assessor 2013
*Content Value estimated; ** Improvements and Contents

Table J.3 lists critical facilities and other community assets identified by the District as important to protect in the event of a disaster.

Table J.3. CMCMD—Critical Facilities and Other Community Assets

Name of Asset	Replacement Value ($)	Hazard Specific Info/Comments
Copper Metro Dist. Building	9,000,000	EOC/ Fire Station
Waste Water Treatment Plant	7,000,000	Critical Facility
Water Pump Houses & Wells	5,000,000	Critical Facility
Repeater Tower (PHQ)	500,000	EMS Communications
Snowmaking (Wildfire water)	5,000,000	Wildfire Fighting Water Source
Snowmaking Control Builds	5,000,000	“ “ “ “
Water Tanks	1,000,000	Domestic/ Fire Fighting Water
Telecommunications Cell Site	1,500,000	Essential Communications
Copper Medical Clinic	1,000,000	EMS Facility
Climax Mine Dam	Unknown	Looming Mudflow/ Flood Hazard
Climax Waste Water Treatment Plant	Unknown	Potential Polluter if Disabled
Century Link Com. Building	Unknown	Essential Communications
Copper Maintenance Shops & Yard	5,000,000	Essential Heavy Equipment
XCEL Gas Pipeline and Power Dist. Lines	Unknown	Essential Energy Distribution
I-70 Transportation System	Unknown	Essential Transportation
Hwy. 91 Transportation System	Unknown	Essential Transportation

Sources: CMCMD

Vulnerability by Hazard

This section examines those existing and future structures and other assets at risk to hazards ranked of moderate or high significance that vary from the risks facing the entire planning area and estimates potential losses. These hazards include dam failure, flood, and wildfire.

Dam Failure

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 are not ranked as high or significant hazard due to the fact that it holds little water. However, failure of these dams would release a devastating toxic sludge debris flow towards the Copper Mountain Metro District area.

Future Development

Flooding due to a dam failure event is likely to 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.

Wildfire

Existing Development

A wildfire threat ranking was developed for the Summit County Community Wildfire Protection Plan by the County, fire protection districts, and U.S. Forest Service. It is based on fuel hazards, risk of wildfire occurrence, essential infrastructure at risk, community values at risk, and local preparedness and firefighting capability and classifies the wildfire threat as low, medium, high, and extreme. The wildfire threat GIS layer, updated in 2011, was used to determine the number of acres in each wildfire threat zone and map the wildfire threat in CMCMD (see Table J.4 and Figure J.2). Figure J.5 shows the wildfire focus areas from the County CWPP and treatment areas in CMCMD.

Table J.4. CMCMD—Acreage in Wildfire Threat Zones

Low		Medium		High		Extreme		
Acres	%Total	Acres	%Total	Acres	%Total	Acres	%Total	Total Acres
108	20%	349	63%	94	17%	-	-	**551**

Source: Summit County

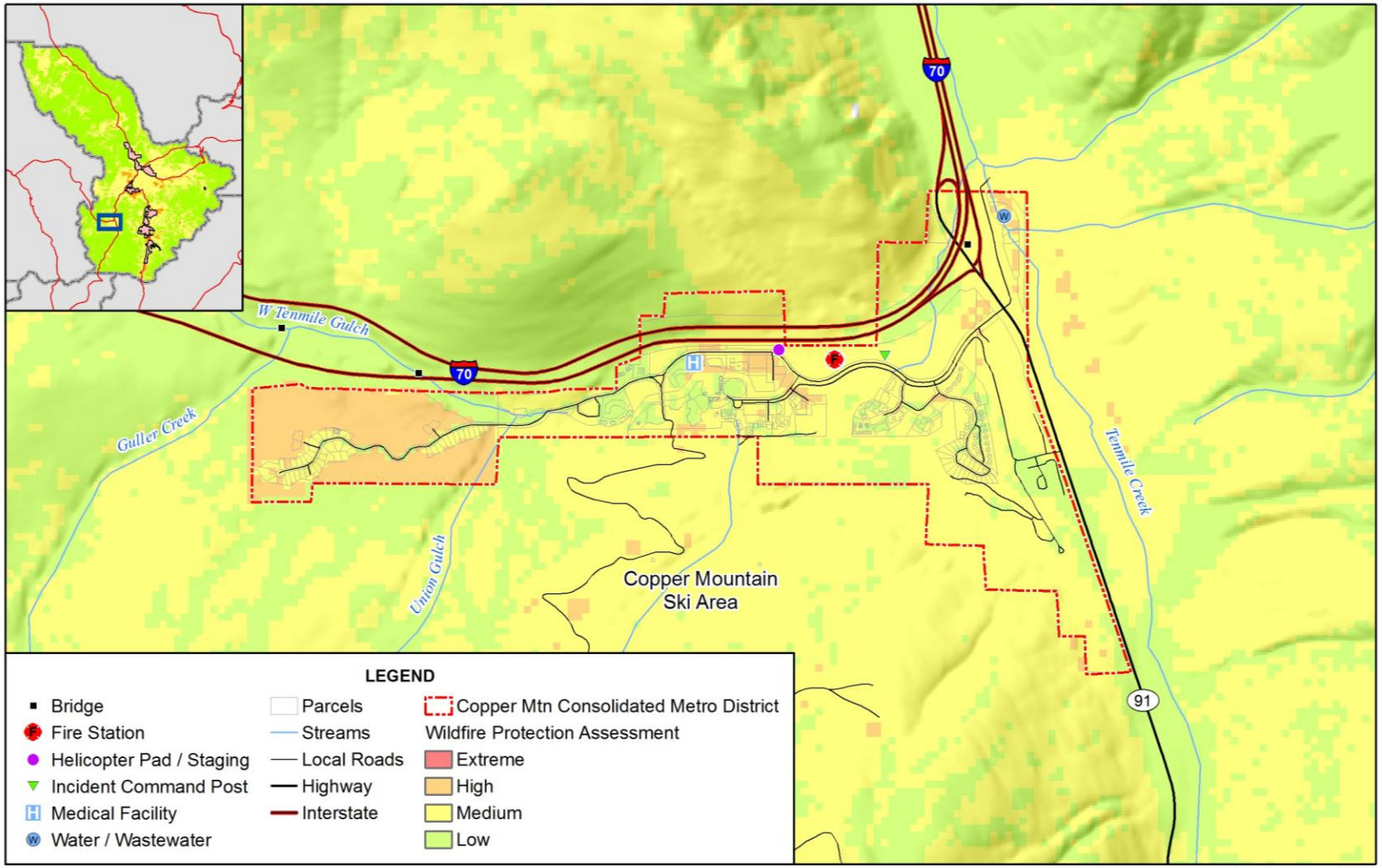
Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard, the property values in CMCMD were separated into wildfire threat zones. The breakdown of property values in CMCMD by wildfire threat zone is shown in Table J.5.

Table J.5. CMCMD—Property Values in Wildfire Threat Zones

Threat Zone	Land Use	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Low	Mixed Use	34	$3,074,118	$221,536,460	$221,536,460	$443,072,920
	Total	**34**	**$3,074,118**	**$221,536,460**	**$221,536,460**	**$443,072,920**
Medium	Mixed Use	118	$53,919,855	$317,654,531	$317,654,531	$635,309,062
	Open Space	3	$7,004,798	$1,734,869	$1,734,869	$3,469,738
	Total	**121**	**$60,924,653**	**$319,389,400**	**$319,389,400**	**$638,778,800**
High	Commercial	1	$939,010	$564,272	$564,272	$1,128,544
	Mixed Use	7	$7,908,118	$11,383,609	$11,383,609	$22,767,218
	Total	**8**	**$8,847,128**	**$11,947,881**	**$11,947,881**	**$23,895,762**
Grand Total		**163**	**$72,845,899**	**$552,873,741**	**$552,873,741**	**$1,105,747,482**

Source: AMEC analysis with County data

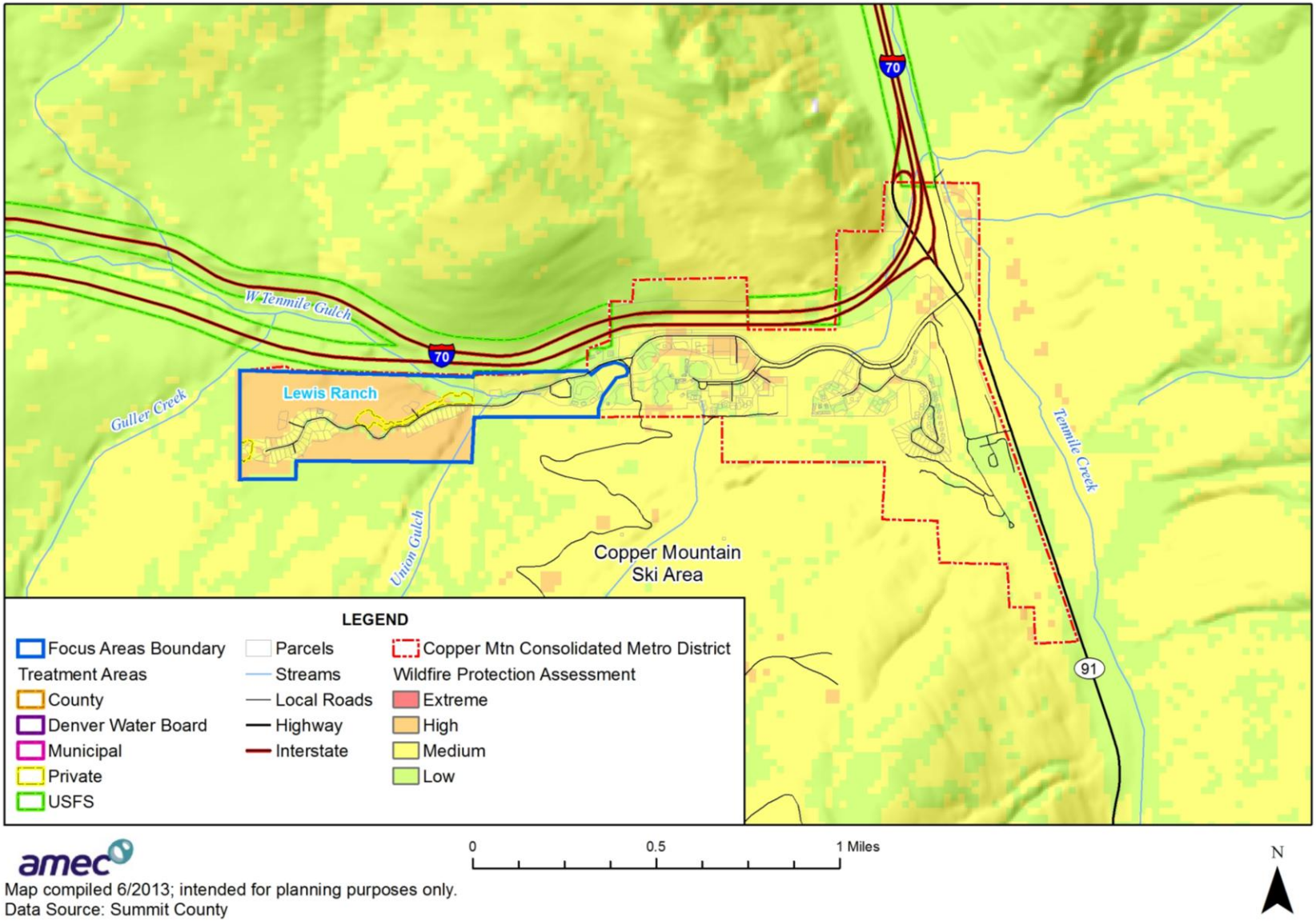
Figure J.2. Wildfire Threat and Critical Facilities in CMCMD



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

Figure J.3. Wildfire Focus Areas and Treatment Areas in CMCMD



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County

The Copper Mountain Fire Department provides fire protection services to CMCMD. CMFD would be the first responders to a wildland fire within CMCMD. CMFD would assume IC until relieved by more qualified personnel. CMFD personnel would remain on scene until dismissed or until the conclusion of the event

Future Development

Wildland-urban interface 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

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.6 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.6. 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	4
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/Waste Water 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.7 identifies the personnel responsible for activities related to mitigation and loss prevention in CMCMD.

Table J.7. 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

- 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.

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
Priority:	High
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 home owners 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:	5 years
Status:	New in 2013

Mitigation Action: CMCMD—2 Enhanced Public Notification

Jurisdiction:	CMCMD
Action Title:	Enhanced public notification through cable network
Priority:	High
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:	New in 2013

Mitigation Action: CMCMD—3 Replace Culverts

Jurisdiction:	CMCMD
Action Title:	Replace Copper Road West Tenmile culverts and Copper Circle West Tenmile culverts
Priority:	High
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:	New in 2013

Mitigation Action: CMCMD—4 Community Wildfire Protection Planning

Jurisdiction:	CMCMD
Action Title:	Community wildfire protection planning
Priority:	High
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:	Ongoing
Status:	New in 2013

K.1 Community Profile

Denver Water is a large special district that includes Summit County within its service area. Denver Water is the State's oldest and largest water utility, established in 1918. It is funded by water rates and new tap fees, as opposed to taxes. Denver Water is run by a five-member Board of Water Commissioners. A designated CEO/Manager is appointed by the Board to execute its policies and orders.

Denver Water's service area encompasses the entirety of Summit County. Refer to the countywide maps in Chapter 3 and in Summit County's annex.

K.2 Hazard Identification and Profiles

Representatives of Denver Water 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 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 Failure	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
Mountain Pine Beetle Infestation	Large	Likely	Critical	High
Severe Winter Weather	Large	Highly Likely	Critical	Medium
Wildfire	Medium	Highly Likely	Catastrophic	High
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.

District Asset Inventory

Table K.2 lists critical facilities and other community assets identified by the District 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

Sources: Denver Water

Vulnerability by Hazard

This section examines those existing and future structures and other assets at risk to hazards ranked of moderate or high significance that vary from the risks facing the entire planning area and estimates potential losses. This section focuses on wildfire impacts to watersheds.

Wildfire

Existing Development

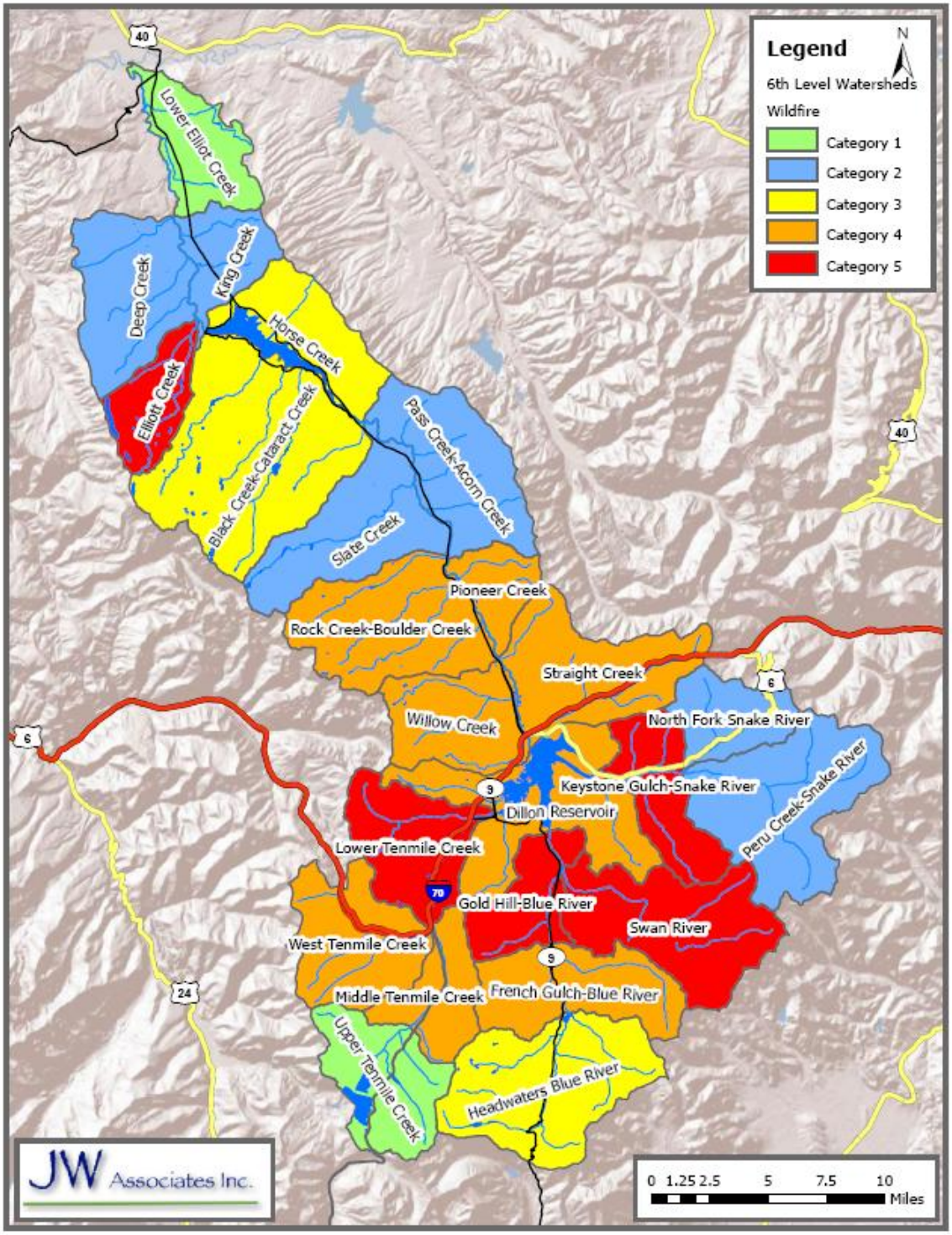
Watersheds and the numerous associated reservoirs in the county could be significantly impacted by high severity wildfire, especially in the wake of the mountain pine beetle epidemic. For example, the damage to Strontia Springs Reservoir caused by siltation from the 1996 Buffalo Creek Fire took fifteen 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.2 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.2. Blue River Watershed Wildfire Hazard Ranking



Source: JW Associates, Inc., Blue River Wildfire/Watershed Assessment 2011

Future Development

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 has already begun to work 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.

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.5 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.5. 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 Management began developing an EOP in August 2012. Emergency manager brought on board to implement a comprehensive emergency management program that will interface with local jurisdictions
Other special plans		Drought Response Plan FERC requires Emergency Action Plans (EAPs) on all dams. Also have treatment and distribution 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.6 identifies the personnel responsible for activities related to mitigation and loss prevention in Denver Water.

Table K.6. Denver Water—Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	N/A	Planning	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Engineering	
Planner/engineer/scientist with an understanding of natural hazards	Yes		Drought planners
Personnel skilled in GIS	Yes	IT/GIS	
Full time building official	N/A		
Floodplain manager	N/A		
Emergency manager	Yes	Operations & Maintenance – Manager of Emergency Response	
Grant writer			
Other personnel			
GIS Data Resources	Yes	IT/GIS	

Personnel Resources	Yes/No	Department/Position	Comments
(Hazard areas, critical facilities, land use, building footprints, etc.)			
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	IT	Everbridge
Other			

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 watershed improvements from the Colorado State Forest Service.

Mitigation Outreach and Partnerships

Denver Water has 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. Additionally, Denver Water has a public affairs division that provides media relations, social media, marketing, publications, internal communication, stakeholder relations, government relations, community outreach, and website communications for both our combined service area of 1.3 million people and for the communities where Denver Water's watersheds and facilities are located.

Past Mitigation Efforts

Denver Water has partnered with USFS 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 Forests to Faucets program.

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
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:	Tentative completion date of 12/31/2013
Status:	New in 2013

Mitigation Action: Denver Water—2 Develop IGA with Summit County

Jurisdiction:	Denver Water
Action Title:	Develop intergovernmental agreement with Summit County
Priority:	Low
Issue/Background:	Denver Water currently has an IGA signed with the Colorado Office of Emergency Management. The Denver Water legal department will develop an IGA for Summit County for emergency management purposes.
Ideas for Implementation:	
Responsible Agency:	Denver Water
Partners:	Summit County OEM
Potential Funding:	Denver Water
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	Strengthening emergency management partnerships; improving emergency preparedness by putting these agreements in place before a disaster or emergency occurs
Timeline:	
Status:	New in 2013

Mitigation Action: Denver Water—3 Update AOP for Property Owners

Jurisdiction:	Denver Water
Action Title:	Update the Annual Operating Plan for Summit County property owners and Denver Water customers
Priority:	Low
Issue/Background:	AOPs are updated on an annual basis. Denver Water met with Summit County officials on 11/28/2012 to provide the updated AOP and basic training on the plan. The 2014 exercise was discussed, and planning efforts were scheduled to begin during Summer 2013.
Ideas for Implementation:	
Responsible Agency:	Denver Water
Partners:	Summit County
Potential Funding:	
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	Informs Summit County customers of projected operations and releases from Denver Water's reservoirs each year; contributes to drought preparedness if water levels are projected to be lower than previous years.
Timeline:	AOPs are updated annually
Status:	New in 2013

Mitigation Action: Denver Water—4 Public Outreach in Summit County

Jurisdiction:	Denver Water
Action Title:	Public outreach efforts in Summit County
Priority:	Low
Issue/Background:	The Denver Water government stakeholder group would like to partner with Summit County stakeholders and 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:	Denver Water participated in Summit County's public workshop for the hazard mitigation plan 2013 update as part of this initiative.
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:	New in 2013

Mitigation Action: Denver Water—5 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
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:	Three years
Status:	New in 2013

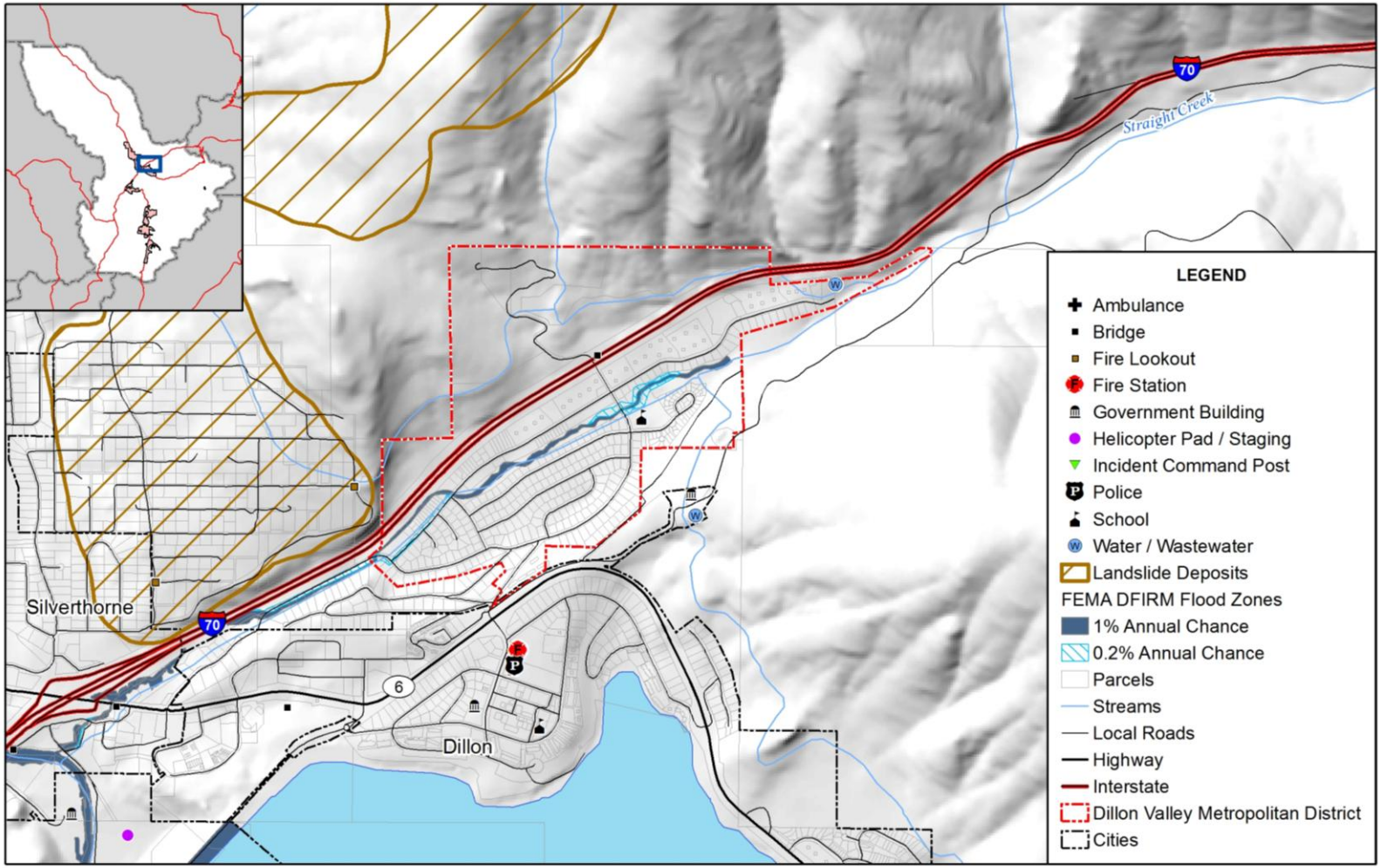
ANNEX L: WATER AND WATER AND SANITATION DISTRICTS

L.1 Community Profile

Several water and water and sanitation districts participated in the 2013 update process for the Summit County Multi-Hazard Mitigation Plan. Participating districts include 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.

Figures L.1 through L.4 show maps of these districts and their locations within Summit County. The maps also show critical facilities, DFIRM and landslide deposits.

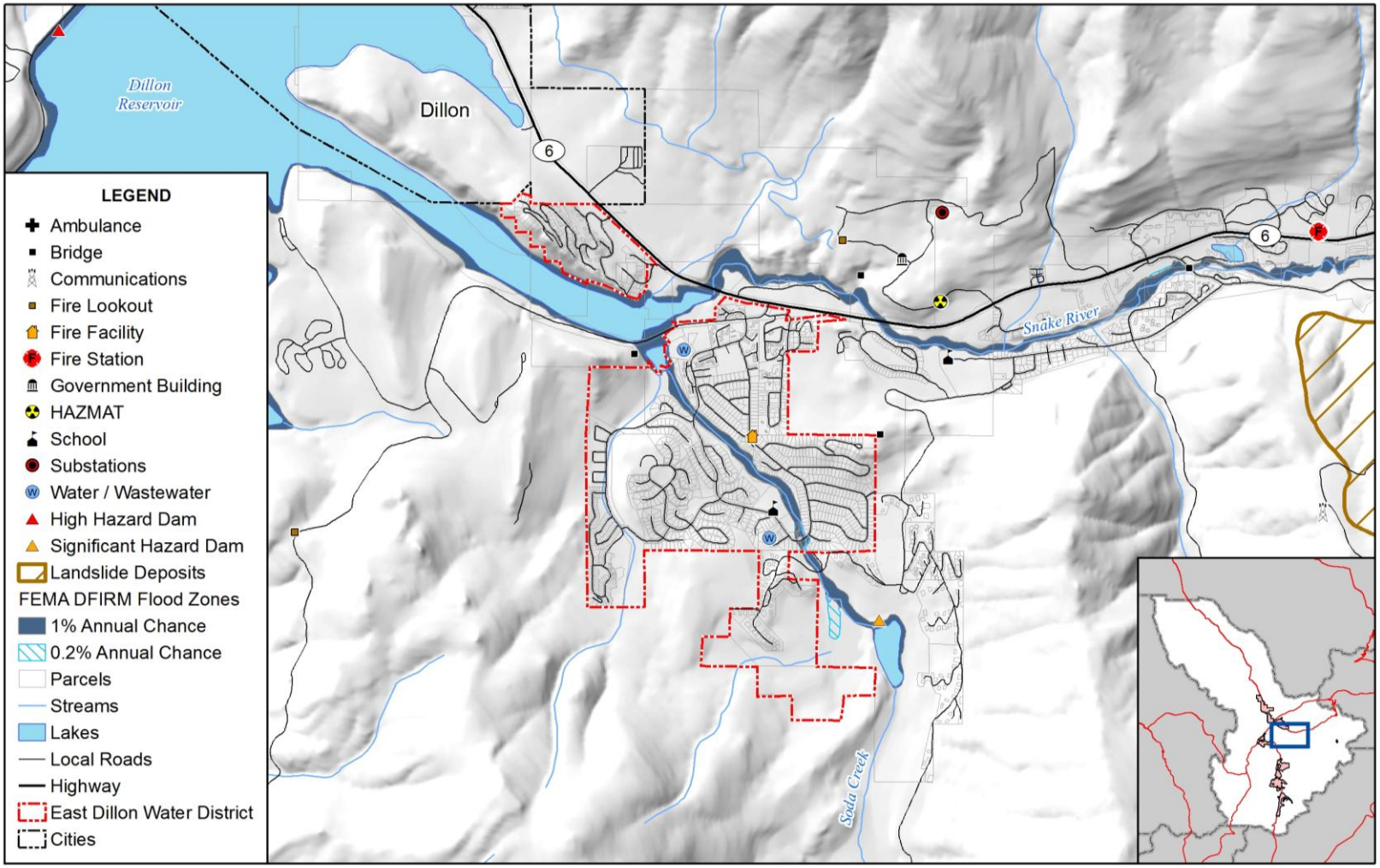
Figure L.1. Map of Dillon Valley District



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, FEMA DFIRM, Colton/USGS Earth Data Analysis Center

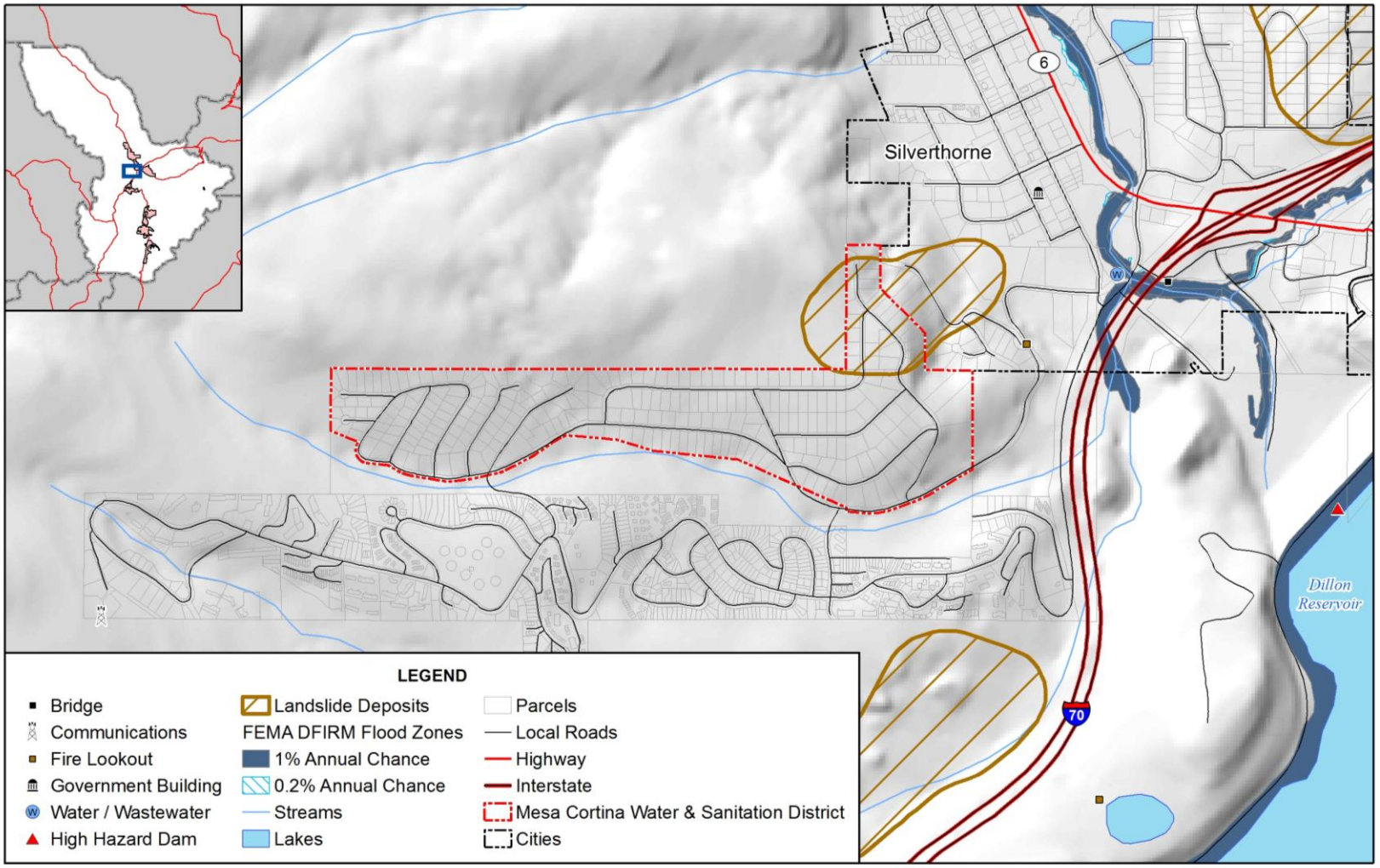
Figure L.2. Map of East Dillon Water District



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, FEMA DFIRM, Colton/USGS Earth Data Analysis Center

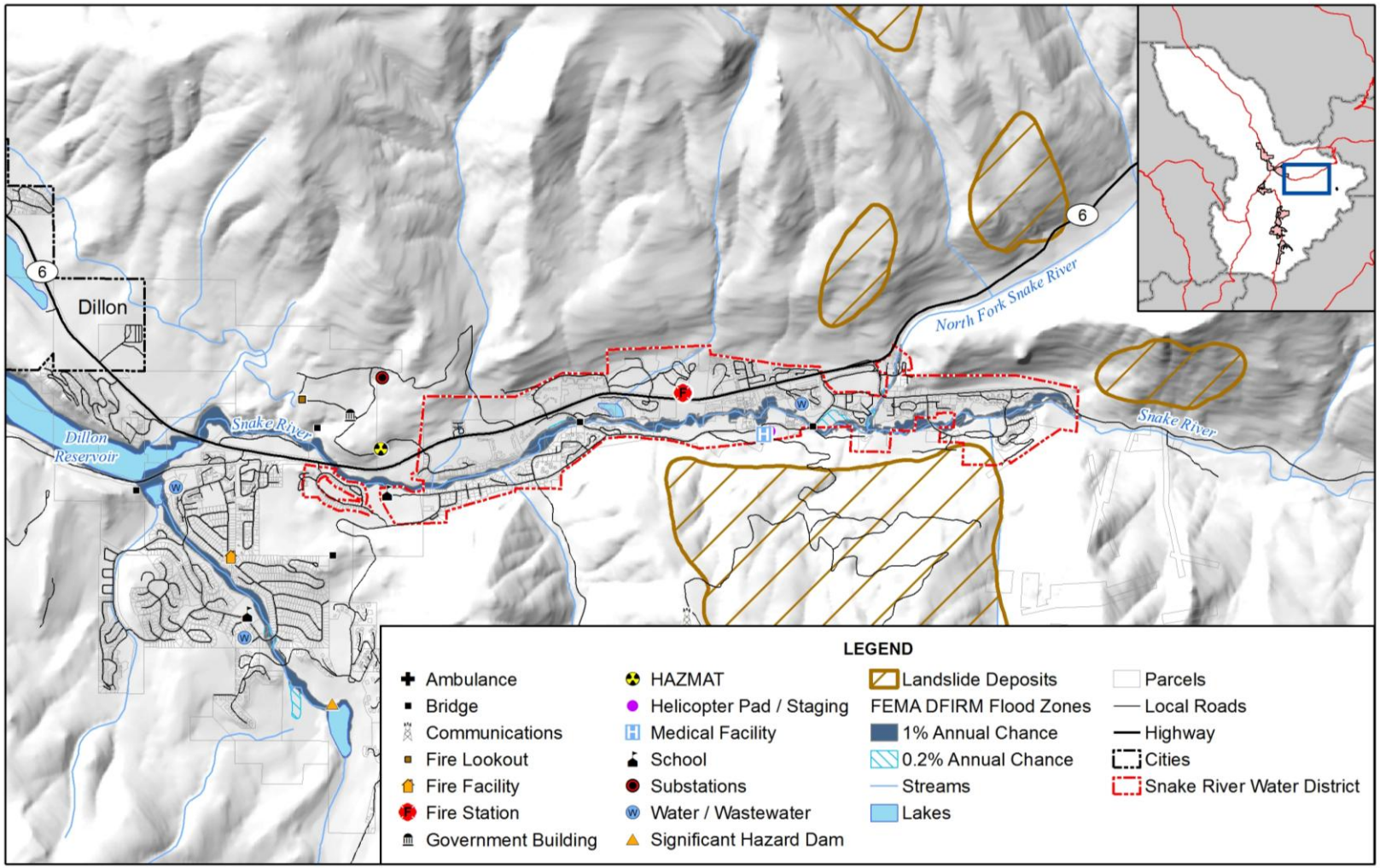
Figure L.3. Map of Mesa Cortina Water and Sanitation District



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, FEMA DFIRM, Colton/USGS Earth Data Analysis Center

Figure L.4. Map of Snake River Water District



amec

0 1 2 Miles

N

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, FEMA DFIRM, Colton/USGS Earth Data Analysis Center

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 and Sanitation Districts—Hazard Summary

Hazard Type	Geographic Location*	Probability*	Magnitude*	Hazard Rating
Dillon Valley District				
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Failure	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	Small	Likely	Limited	High
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Occasional	Limited	Medium
Lightning	Large	Highly Likely	Negligible	Low
Mountain Pine Beetle Infestation	Large	Highly Likely	Limited	Medium
Severe Winter Weather	Large	Likely	Negligible	Low
Wildfire	Large	Occasional	Critical	High
Windstorm	Large	Likely	Limited	Low
East Dillon Water District				
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Failure	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	Isolated	Unlikely	Negligible	Low
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Unlikely	Negligible	Low
Lightning	Isolated	Highly Likely	Negligible	Low
Mountain Pine Beetle Infestation	Large	Highly Likely	Limited	Medium
Severe Winter Weather	Large	Likely	Negligible	Low
Wildfire	Large	Occasional	Critical	High
Windstorm	Large	Likely	Limited	Low
Mesa Cortina Water and Sanitation District				
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Failure	Isolated	Unlikely	Limited	Low
Drought	Large	Likely	Negligible	Medium
Earthquake	Isolated	Occasional	Limited	Low
Erosion/Deposition	Isolated	Unlikely	Negligible	Low

Hazard Type	Geographic Location*	Probability*	Magnitude*	Hazard Rating
Flood	Isolated	Unlikely	Negligible	Low
Hazardous Materials Release	Isolated	Unlikely	Negligible	Low
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Unlikely	Negligible	Low
Lightning	Isolated	Highly Likely	Negligible	Low
Mountain Pine Beetle Infestation	Large	Highly Likely	Limited	Medium
Severe Winter Weather	Large	Likely	Negligible	Low
Wildfire	Large	Occasional	Critical	High
Windstorm	Large	Likely	Limited	Low
Snake River Water District				
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Failure	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	Isolated	Likely	Critical	High
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Likely	Critical	Medium
Lightning	Isolated	Highly Likely	Negligible	Low
Mountain Pine Beetle Infestation	Large	Highly Likely	Limited	Medium
Severe Winter Weather	Large	Likely	Negligible	Low
Wildfire	Large	Occasional	Critical	High
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.

L.3 Vulnerability Assessment

The intent of this section is to assess the water and water and 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. For more information about how hazards affect the County as a whole, see Chapter 3 Risk Assessment.

District Asset Inventory

Table L.2 shows the number of structures, land value, and assessed value of improvements to parcels in the districts in this annex. Land values have been purposely excluded from the Total Value because land remains following disasters, and subsequent market devaluations are frequently short-term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

Table L.2. Water and Water/Sanitation Districts—Building Exposure

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improvements Value	Estimated Content Value*	Total Value**
Dillon Valley District						
Government	7	1	$121,864	$250,694	$250,694	$501,388
Mixed Use	5	4	$41,651	$2,325,777	$2,325,777	$4,651,554
Open Space	3	0	$0	$0	$0	$0
Residential	369	349	$40,173,178	$177,099,380	$177,099,380	$354,198,760
Total	**384**	**354**	**$40,336,693**	**$179,675,851**	**$179,675,851**	**$359,351,702**
East Dillon Water District						
Commercial	1	1	$0	$1,335,195	$1,335,195	$2,670,390
Government	8	0	$0	$0	$0	$0
Mixed Use	2	0	$100,387	$0	$0	$0
Open Space	35	1	$408,349	$43,102	$43,102	$86,204
Other	2	0	$0	$0	$0	$0
Residential	1,231	1,068	$194,768,332	$439,419,032	$219,709,516	$659,128,548
Total	**1,279**	**1,070**	**$195,277,068**	**$440,797,329**	**$221,087,813**	**$661,885,142**
Mesa Cortina Water and Sanitation District						
Mixed Use	3	2	$535,052	$840,627	$840,627	$1,681,254
Open Space	1	0	$0	$0	$0	$0
Residential	277	229	$52,336,933	$85,001,408	$42,500,704	$127,502,112
Total	**281**	**231**	**$52,871,985**	**$85,842,035**	**$43,341,331**	**$129,183,366**
Snake River Water District						
Commercial	15	12	$7,037,888	$33,504,698	$33,504,698	$67,009,396
Government	21	16	$1,685,567	$221,480,456	$221,480,456	$442,960,912
Mixed Use	7	7	$2,559,239	$65,121,816	$65,121,816	$130,243,632
Open Space	44	5	$1,022,520	$27,745,829	$27,745,829	$55,491,658
Residential	496	370	$138,298,272	$822,942,743	$411,471,372	$1,234,414,115
Total	**583**	**410**	**$150,603,486**	**$1,170,795,542**	**$759,324,171**	**$1,930,119,713**
Grand Total	**2,527**	**2,065**	**$439,089,232**	**$1,877,110,757**	**$1,203,429,166**	**$3,080,539,923**

Source: Summit County Assessor 2013
*Content Value estimated; ** Improvements and Contents

Table L.3 lists critical facilities and other community assets identified by each district as important to protect in the event of a disaster.

Table L.3. Water and Water and Sanitation Districts—Critical Facilities and Other Community Assets

Name of Asset	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Info/Comments
Dillon Valley District			
Water treatment plant	3,500,000		Wildfire, contamination, flood, and lightning
Water tanks	2,500,000		Earthquake
Water source	Unknown		Wildfire, contamination, and flood
Maintenance building	300,000		Wildfire and flood
Water and sewer lines	1,000,000		Flood
East Dillon Water District			
Water treatment plant	2,000,000		Wildfire and lightning
Water tanks	4,500,000		Earthquake and lightning
Water source	Unknown		Wildfire, contamination, and flood
Domestic water wells	3,000,000		Flood and contamination
Water and sewer lines	1,000,000		Flood
Well house	500,000		Flood
Mesa Cortina Water and Sanitation District			
Water treatment plant	750,000		Wildfire and lightning
Water tank	1,000,000		Wildfire, earthquake, and lightning
Water source	Unknown		Wildfire, drought, and contamination
Domestic water wells	500,000		Drought and contamination
Snake River Water District			
2 water treatment plants	3,200,000 each		Wildfire
4 water storage tanks	3,000,000 each		Landslide, wildfire
7 domestic water wells	60,000 each		Contamination
Water transmission lines	1,000,000		Landslide

Sources: HCMD

Vulnerability by Hazard

This section examines those existing and future structures and other assets at risk to hazards ranked of moderate or high significance that vary from the risks facing the entire planning area and estimates potential losses. This includes wildfire.

Wildfire

Existing Development

A wildfire threat ranking was developed for the Summit County Community Wildfire Protection Plan by the County, fire protection districts, and U.S. Forest Service. It is based on fuel hazards, risk of wildfire occurrence, essential infrastructure at risk, community values at risk, and local preparedness and firefighting capability and classifies the wildfire threat as low, medium, high, and extreme. The wildfire threat GIS layer, updated in 2011, was used to determine the number of acres in each wildfire threat zone and map the wildfire threat in the districts (see Table L.4 and Figure L.5 through L.8). Figure L.9 through L.12 show the wildfire focus areas from the County CWPP and treatment areas in the districts.

Table L.4. Districts—Acreage in Wildfire Threat Zones

	Low		Medium		High		Extreme		
District	**Acres**	**%Total**	**Acres**	**%Total**	**Acres**	**%Total**	**Acres**	**%Total**	**Total Acres**
Dillon Valley	201	49%	193	47%	17	4%	-	-	**411**
East Dillon Water	13	1.4%	469	49%	460	48%	14	1.5%	**956**
Mesa Cortina Water & Sanitation	14	8%	104	57%	66	36%	-	-	**184**
Snake River Water	23	2%	709	67%	325	31%	1	0.1%	**1,058**
Totals	**251**	**10%**	**1,475**	**57%**	**868**	**33%**	**15**	**0.57%**	**2,609**

Source: AMEC analysis with Summit County data

Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard, the property values in the districts were separated into wildfire threat zones. The breakdown of property values in the districts by wildfire threat zone is shown in Table L.5. Most of the acreage in the districts is in medium to high wildfire threat zones. These zones have the most property value at risk as well.

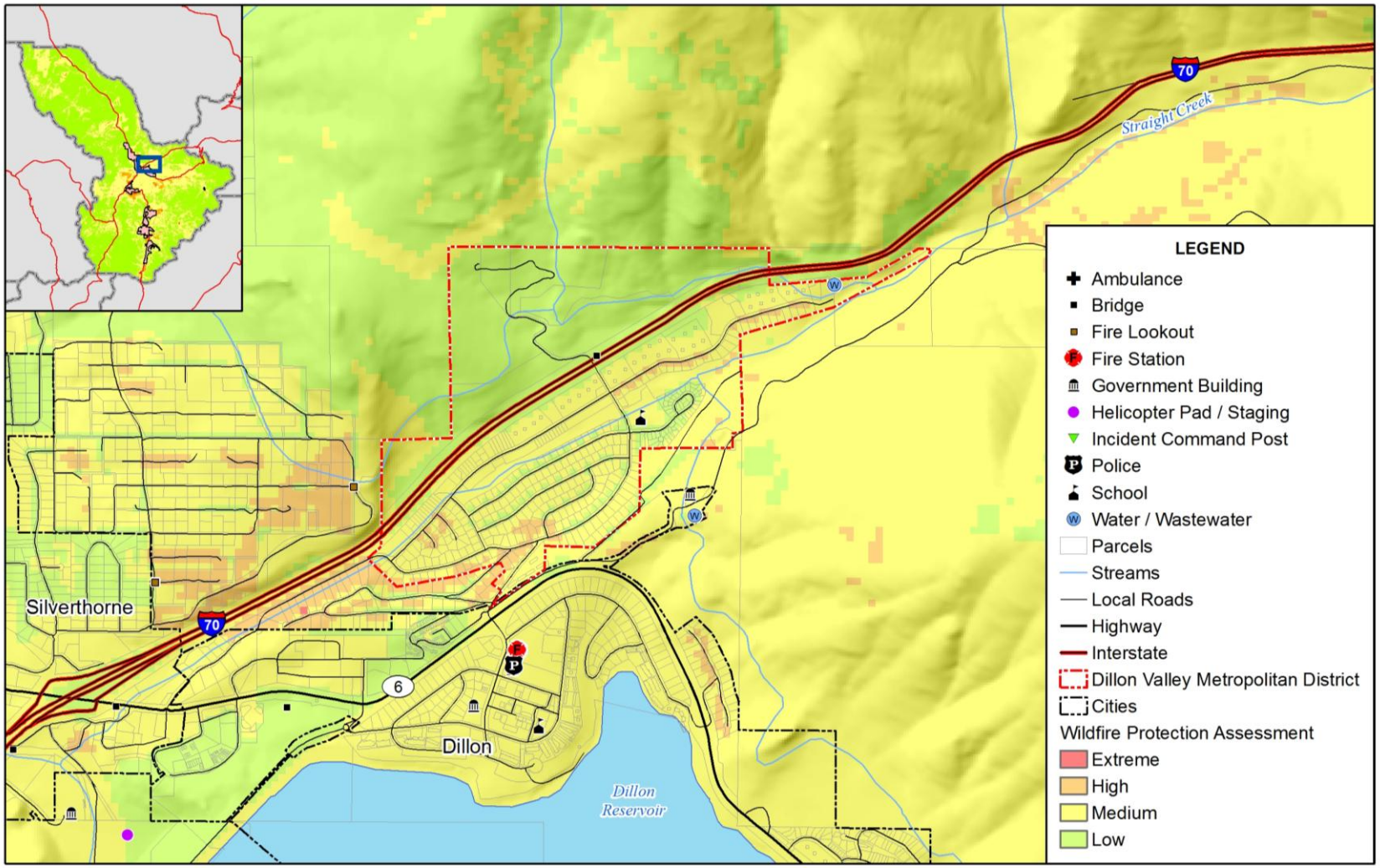
Table L.5. Districts—Property Values in Wildfire Threat Zones

Threat Zone	Land Use	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Dillon Valley District						
Low	Mixed Use	4	$41,651	$2,325,777	$2,325,777	$4,651,554
	Residential	64	$6,644,250	$14,969,810	$7,484,905	$22,454,715
	Total	**68**	**$6,685,901**	**$17,295,587**	**$9,810,682**	**$27,106,269**
Medium	Government	1	$121,864	$250,694	$250,694	$501,388
	Residential	257	$30,348,319	$154,377,653	$77,188,827	$231,566,480
	Total	**258**	**$30,470,183**	**$154,628,347**	**$77,439,521**	**$232,067,868**
High	Residential	28	$3,180,609	$7,751,917	$3,875,959	$11,627,876
	Total	**28**	**$3,180,609**	**$7,751,917**	**$3,875,959**	**$11,627,876**
Totals		**354**	**$40,336,693**	**$179,675,851**	**$91,126,161**	**$270,802,012**

Threat Zone	Land Use	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
East Dillon Water District						
Medium	Residential	424	$69,833,031	$187,938,905	$93,969,453	$281,908,358
	Total	**424**	**$69,833,031**	**$187,938,905**	**$93,969,453**	**$281,908,358**
High	Commercial	1	$0	$1,335,195	$1,335,195	$2,670,390
	Open Space	1	$96,897	$43,102	$43,102	$86,204
	Residential	634	$121,536,870	$247,230,231	$123,615,116	$370,845,347
	Total	**636**	**$121,633,767**	**$248,608,528**	**$124,993,413**	**$373,601,941**
Extreme	Residential	10	$3,398,431	$4,249,896	$2,124,948	$6,374,844
	Total	**10**	**$3,398,431**	**$4,249,896**	**$2,124,948**	**$6,374,844**
Totals		**1,070**	**$194,865,229**	**$440,797,329**	**$221,087,813**	**$661,885,142**
Mesa Cortina Water and Sanitation District						
Low	Residential	7	$1,391,392	$2,912,611	$1,456,306	$4,368,917
	Total	**7**	**$1,391,392**	**$2,912,611**	**$1,456,306**	**$4,368,917**
Medium	Residential	105	$26,158,893	$39,669,417	$19,834,709	$59,504,126
	Total	**105**	**$26,158,893**	**$39,669,417**	**$19,834,709**	**$59,504,126**
High	Mixed Use	2	$535,052	$840,627	$840,627	$1,681,254
	Residential	117	$24,786,648	$42,419,380	$21,209,690	$63,629,070
	Total	**119**	**$25,321,700**	**$43,260,007**	**$22,050,317**	**$65,310,324**
Totals		**231**	**$52,871,985**	**$85,842,035**	**$43,341,331**	**$129,183,366**
Snake River Water District						
Low	Residential	7	$1,933,384	$5,382,161	$2,691,081	$8,073,242
	Total	**7**	**$1,933,384**	**$5,382,161**	**$2,691,081**	**$8,073,242**
Medium	Commercial	9	$5,502,505	$32,672,035	$32,672,035	$65,344,070
	Government	10	$418,756	$172,604,207	$172,604,207	$345,208,414
	Mixed Use	5	$2,392,104	$54,003,346	$54,003,346	$108,006,692
	Open Space	3	$918,370	$26,457,001	$26,457,001	$52,914,002
	Residential	166	$69,066,022	$554,952,526	$277,476,263	$832,428,789
	Total	**193**	**$78,297,757**	**$840,689,115**	**$563,212,852**	**$1,403,901,967**
High	Commercial	3	$1,535,383	$832,663	$832,663	$1,665,326
	Government	6	$1,266,811	$48,876,249	$48,876,249	$97,752,498
	Mixed Use	2	$167,135	$11,118,470	$11,118,470	$22,236,940
	Open Space	2	$104,150	$1,288,828	$1,288,828	$2,577,656
	Residential	195	$66,603,576	$261,383,817	$130,691,909	$392,075,726
	Total	**208**	**$69,677,055**	**$323,500,027**	**$192,808,119**	**$516,308,146**
Extreme	Residential	2	$695,290	$1,224,239	$612,120	$1,836,359
	Total	**2**	**$695,290**	**$1,224,239**	**$612,120**	**$1,836,359**
Totals		**410**	**150,603,486**	**1,170,795,542**	**759,324,171**	**1,930,119,713**
Grand Total		**2,065**	**$438,677,393**	**$1,877,110,757**	**$1,114,879,476**	**$2,991,990,233**

Source: AMEC analysis with County data

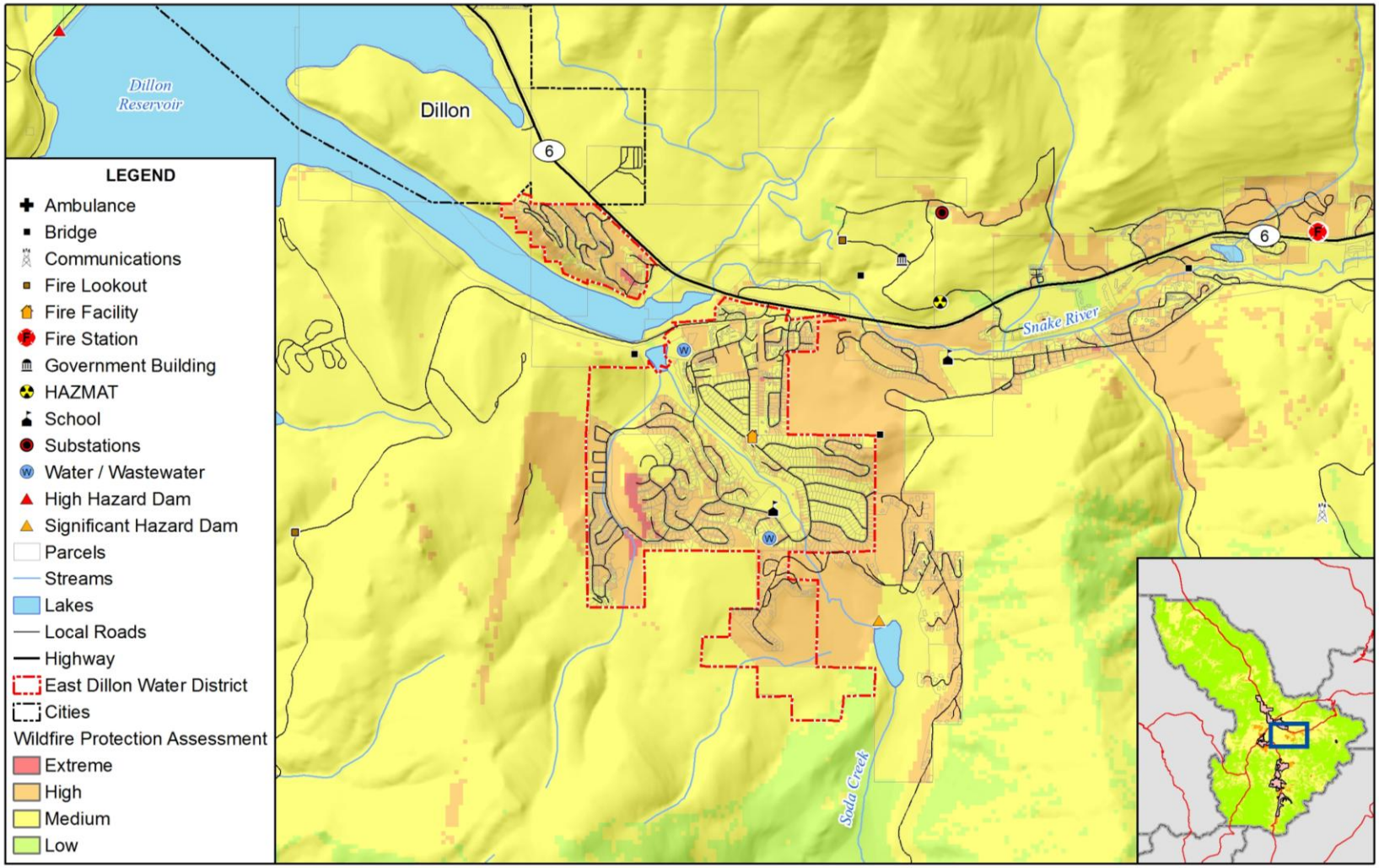
Figure L.5. Wildfire Threat and Critical Facilities in Dillon Valley District



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

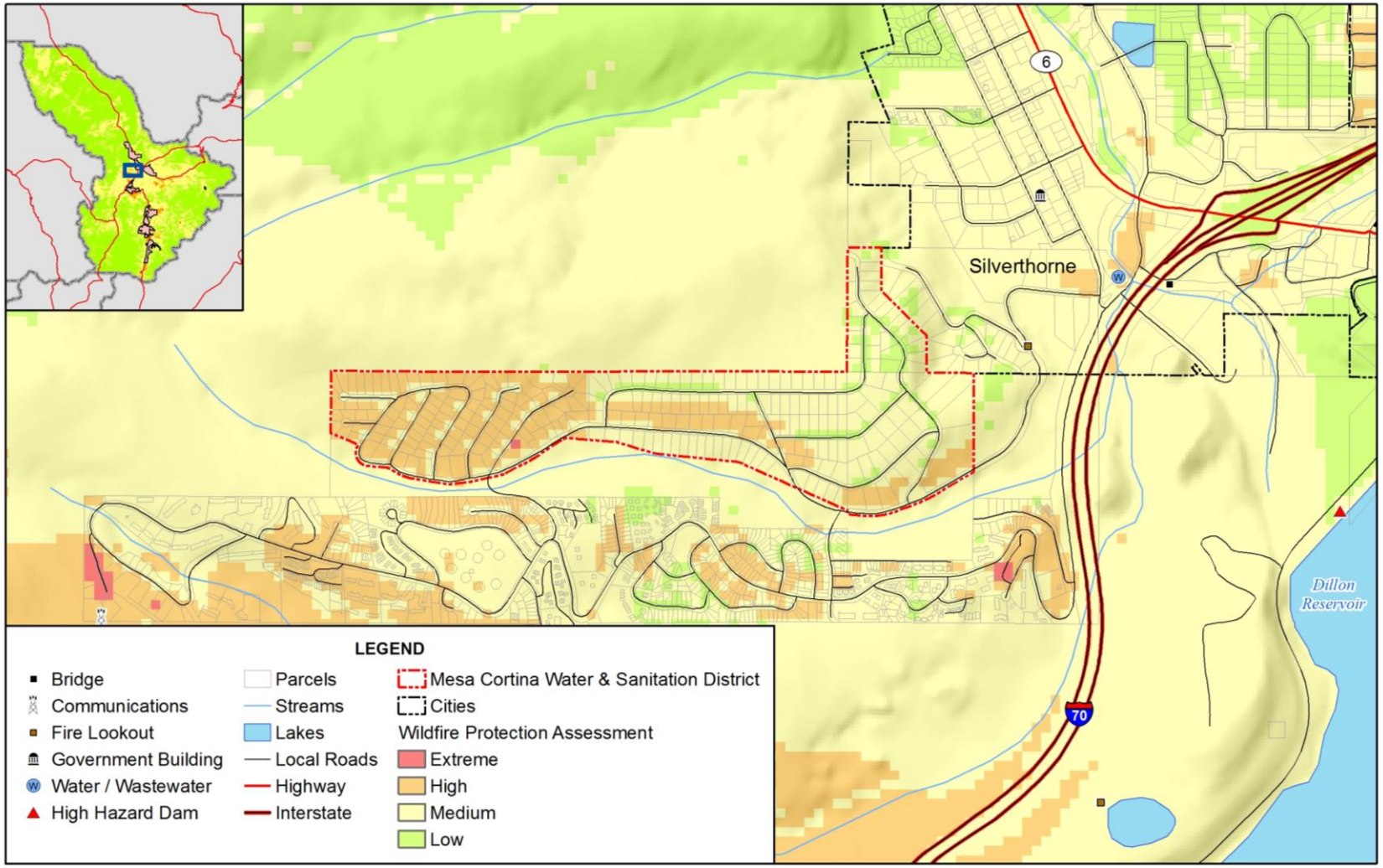
Figure L.6. Wildfire Threat and Critical Facilities in East Dillon Water District



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

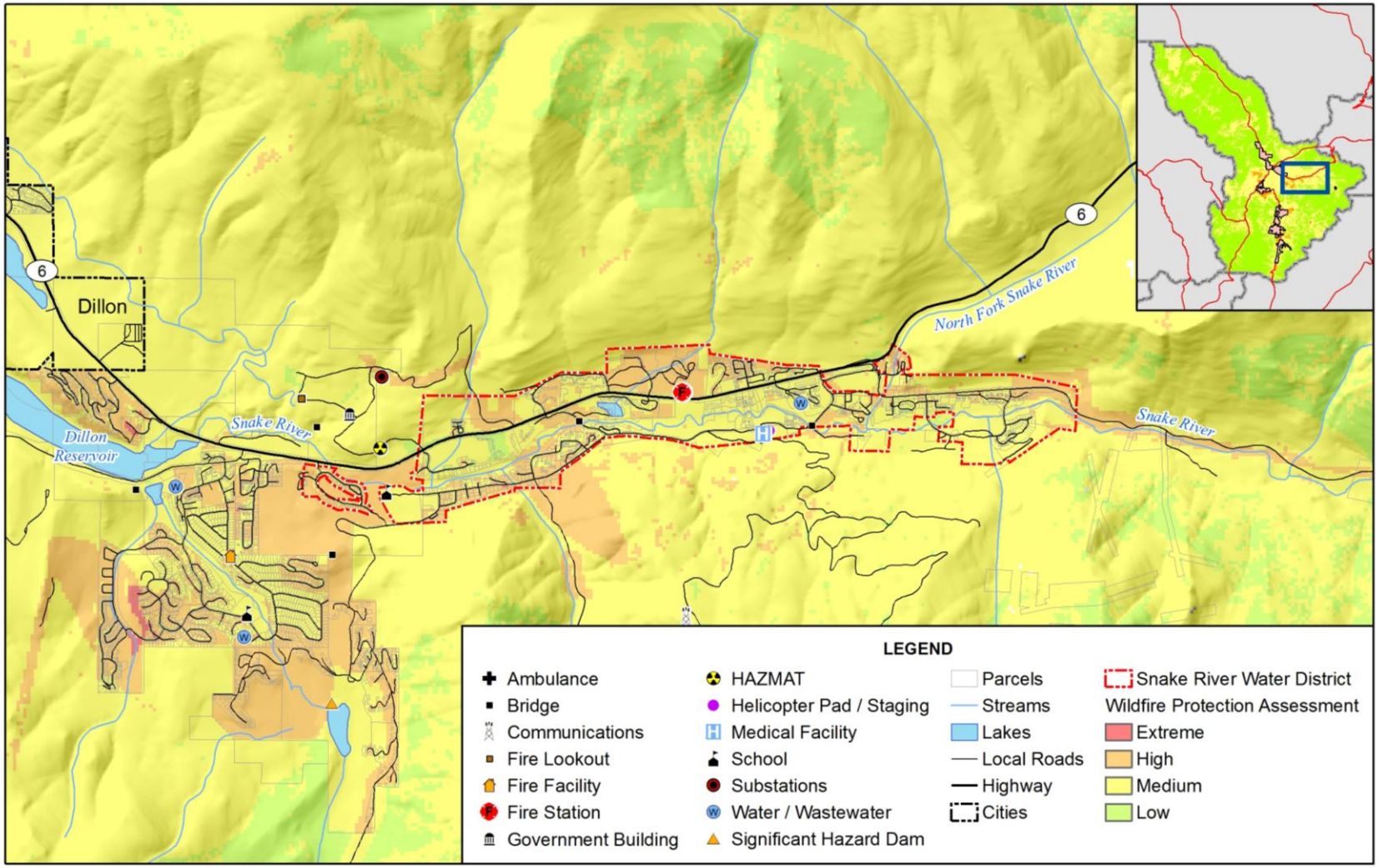
Figure L.7. Wildfire Threat and Critical Facilities in Mesa Cortina Water and Sanitation District



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

Figure L.8. Wildfire Threat and Critical Facilities in Snake River Water District



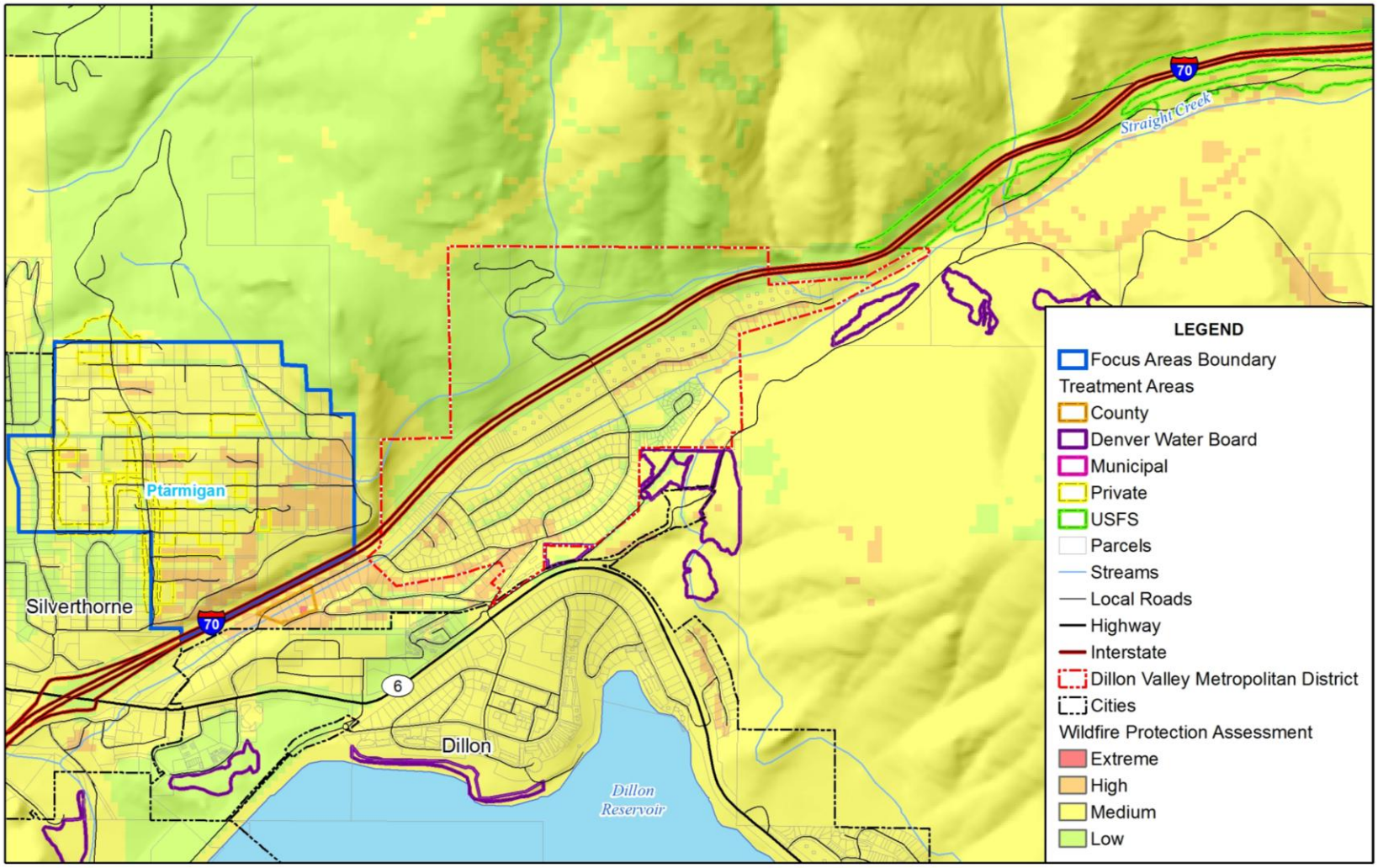
amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

0 1 2 Miles

N

Figure L.9. Wildfire Focus Areas and Treatment Areas in Dillon Valley District



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County

Figure L.10. Wildfire Focus Areas and Treatment Areas in East Dillon Water District

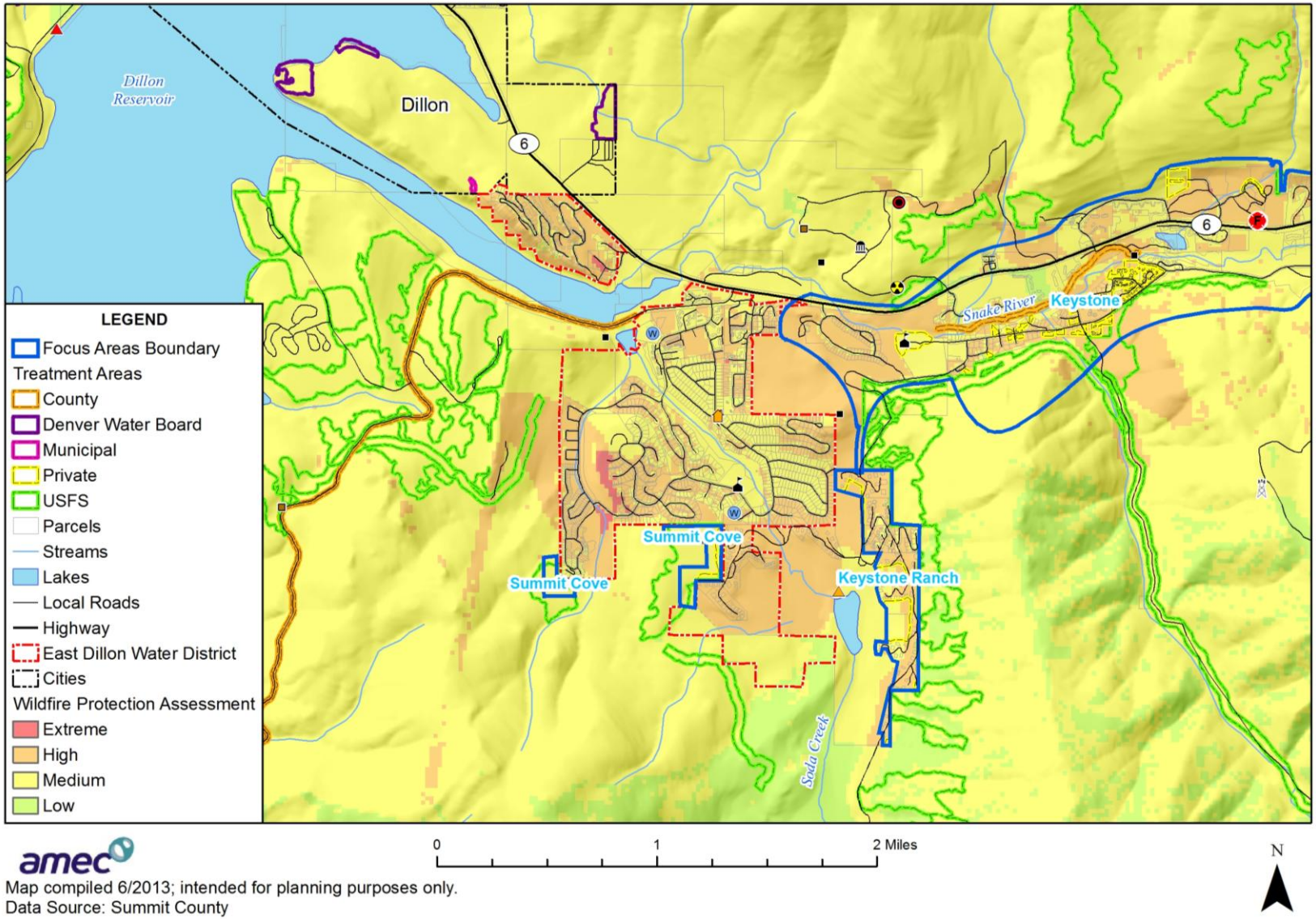
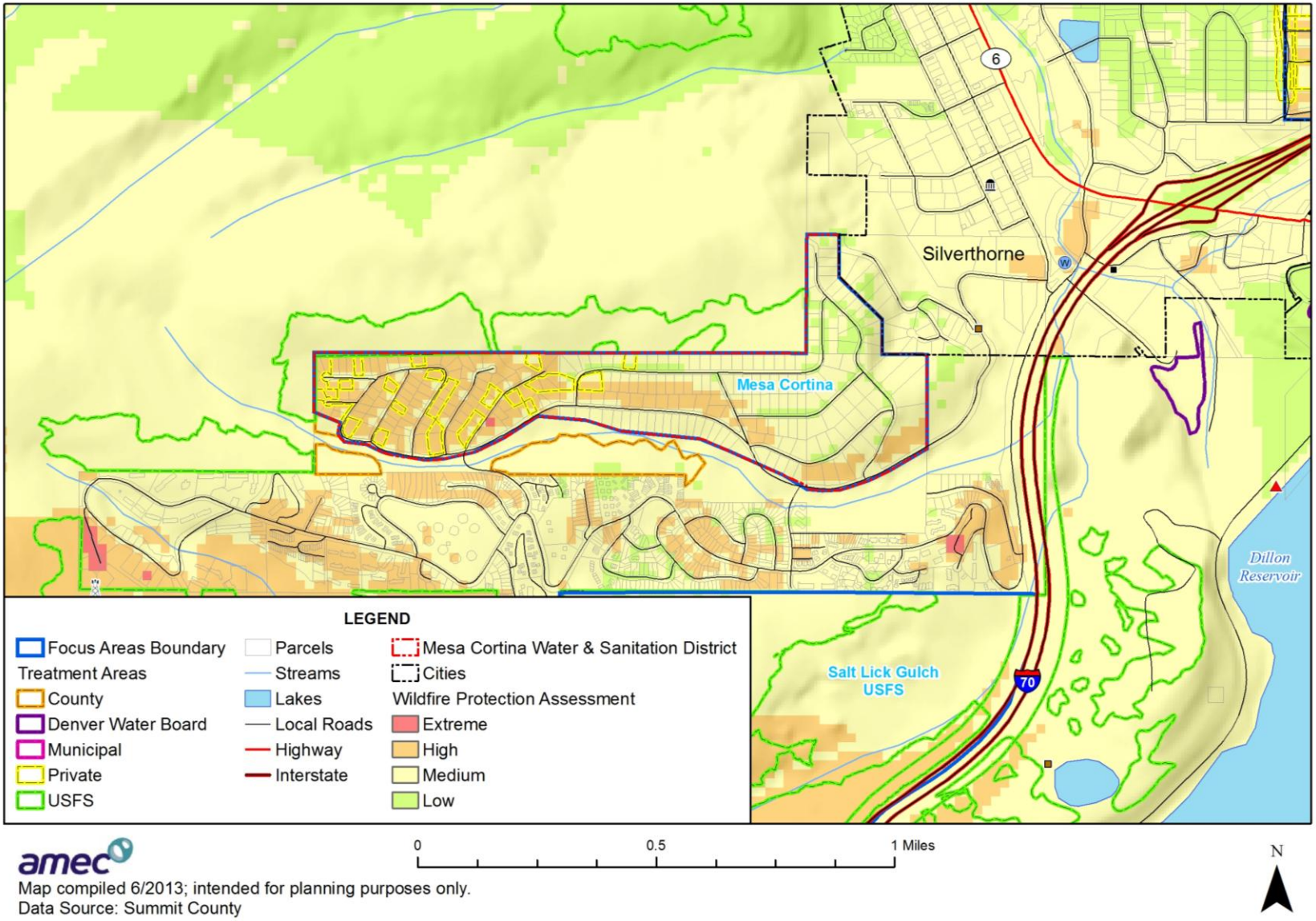


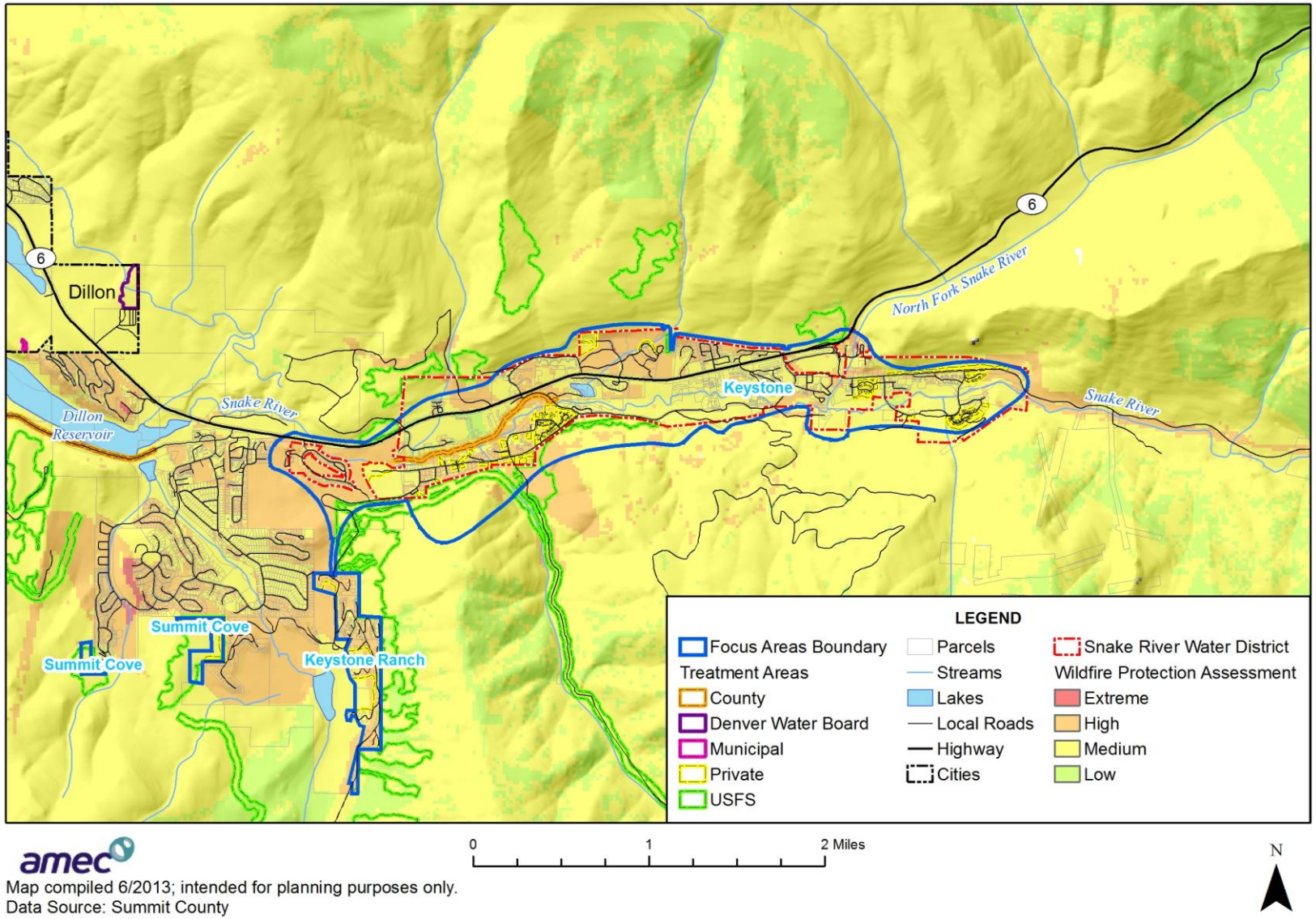
Figure L.11. Wildfire Focus Areas and Treatment Areas in Mesa Cortina Water and Sanitation District



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County

Figure L.12. Wildfire Focus Areas and Treatment Areas in Snake River Water District



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County

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 the 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

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 and 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. Tables L.6 through L.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 the districts.

Table L.6. 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	

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
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. 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.8. 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.9. 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

Tables L.10 through L.13 identify the personnel responsible for activities related to mitigation and loss prevention in the districts.

Table L.10. 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.11. 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.12. 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.13. 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 and sanitation districts could or already do use to help fund mitigation activities.

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

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
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:	Five years
Status:	New in 2013. In planning stages.

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
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:	Five years
Status:	New in 2013. In planning stages.

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
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:	Five years
Status:	New in 2013. In planning stages.

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)
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:	New in 2013

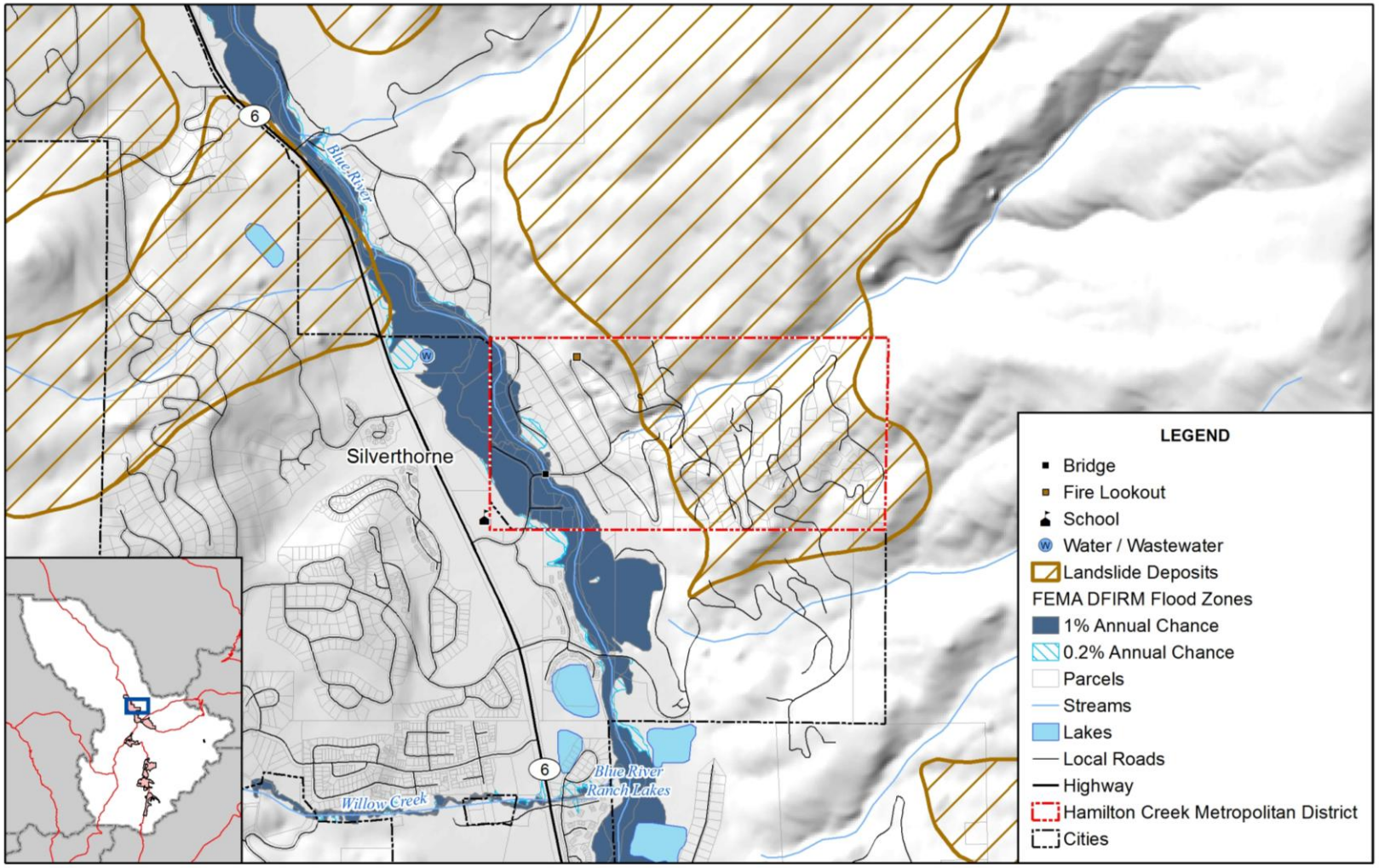
ANNEX M: HAMILTON CREEK METROPOLITAN DISTRICT

M.1 Community Profile

Hamilton Creek Metropolitan District (HCMD) is a special district in Summit County. 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 a map of HCMD and its location within Summit County. The map also shows critical facilities, DFIRM and landslide deposits.

Figure M.1. Map of Hamilton Creek Metropolitan District



amec

0 0.5 1 Miles

N

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1, FEMA DFIRM, Colton/USGS Earth Data Analysis Center

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*	Magnitude*	Hazard Rating
Avalanche	Isolated	Unlikely	Negligible	Low
Dam Failure	Isolated	Unlikely	Limited	Low
Drought	Large	Likely	Negligible	Medium
Earthquake	Isolated	Occasional	Limited	Low
Erosion/Deposition	Isolated	Unlikely	Negligible	Low
Flood	Isolated	Occasional	Limited	Low
Hazardous Materials Release	Isolated	Unlikely	Negligible	Low
Landslide, Mudflow/Debris Flow, Rock Fall	Isolated	Occasional	Negligible	Low
Lightning	Isolated	Highly Likely	Negligible	Low
Mountain Pine Beetle Infestation	Large	Highly Likely	Limited	Medium
Severe Winter Weather	Large	Likely	Limited	Low
Wildfire	Large	Occasional	Critical	High
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.

M.3 Vulnerability Assessment

The intent of this section is to assess HCMD'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.

District Asset Inventory

Table M.2 shows the number of structures, land value, and assessed value of improvements to parcels in HCMD. Land values have been purposely excluded from the total value because land remains following disasters, and subsequent market devaluations are frequently short-term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

Table M.2. HCMD—Building Exposure

Land Use	Total Parcel Count	Improved Parcel Count	Land Value	Improvements Value	Estimated Content Value*	Total Value**
Government	1	0	$0	$0	$0	$0
Mixed Use	15	12	$3,316,374	$4,350,860	$4,350,860	$8,701,720
Open Space	10	0	$0	$0	$0	$0
Other	2	0	$0	$0	$0	$0
Residential	186	150	$44,265,105	$66,225,327	$33,112,664	$99,337,991
Total	**214**	**162**	**$47,581,479**	**$70,576,187**	**$37,463,524**	**$108,039,711**

Source: Summit County Assessor 2013
*Content Value estimated; ** Improvements and Contents

Table M.3 lists critical facilities and other community assets identified by the District as important to protect in the event of a disaster.

Table M.3. HCMD—Critical Facilities and Other Community Assets

Name of Asset	Replacement Value ($)	Hazard Specific Info/Comments
Water Treatment Plant	1,000,000	Wildfire, flood, and lightning
Water Tank	750,000	Wildfire, earthquake, and lightning
Water source	unknown	Wildfire, contamination, and flood

Sources: HCMD

Vulnerability by Hazard

This section examines those existing and future structures and other assets at risk to hazards ranked of moderate or high significance that vary from the risks facing the entire planning area and estimates potential losses. These hazards include flood, landslide, and wildfire. As depicted in Figure M.1, a significant portion of HCMD is located in either the 1% annual chance flood hazard or in a landslide deposit area. HCMD representatives identified their water treatment plant and water source as at risk to flood. No assets or critical facilities were identified in landslide deposit areas, but a large percentage of the developed areas in the district are within landslide deposits. A more detailed investigation would be needed to determine the landslide risk and probability of recurrence.

Wildfire

Existing Development

A wildfire threat ranking was developed for the Summit County Community Wildfire Protection Plan by the County, fire protection districts, and U.S. Forest Service. It is based on fuel hazards, risk of wildfire occurrence, essential infrastructure at risk, community values at risk, and local

preparedness and firefighting capability and classifies the wildfire threat as low, medium, high, and extreme. The wildfire threat GIS layer, updated in 2011, was used to determine the number of acres in each wildfire threat zone and map the wildfire threat in HCMD (see Table M.4 and Figure M.2). Figure M.5 shows the wildfire focus areas from the County CWPP and treatment areas in HCMD.

Table M.4. HCMD—Acreage in Wildfire Threat Zones

Low		Medium		High		Extreme		
Acres	%Total	Acres	%Total	Acres	%Total	Acres	%Total	Total Acres
15	5%	258	78%	59	18%	-	-	**332**

Source: Summit County

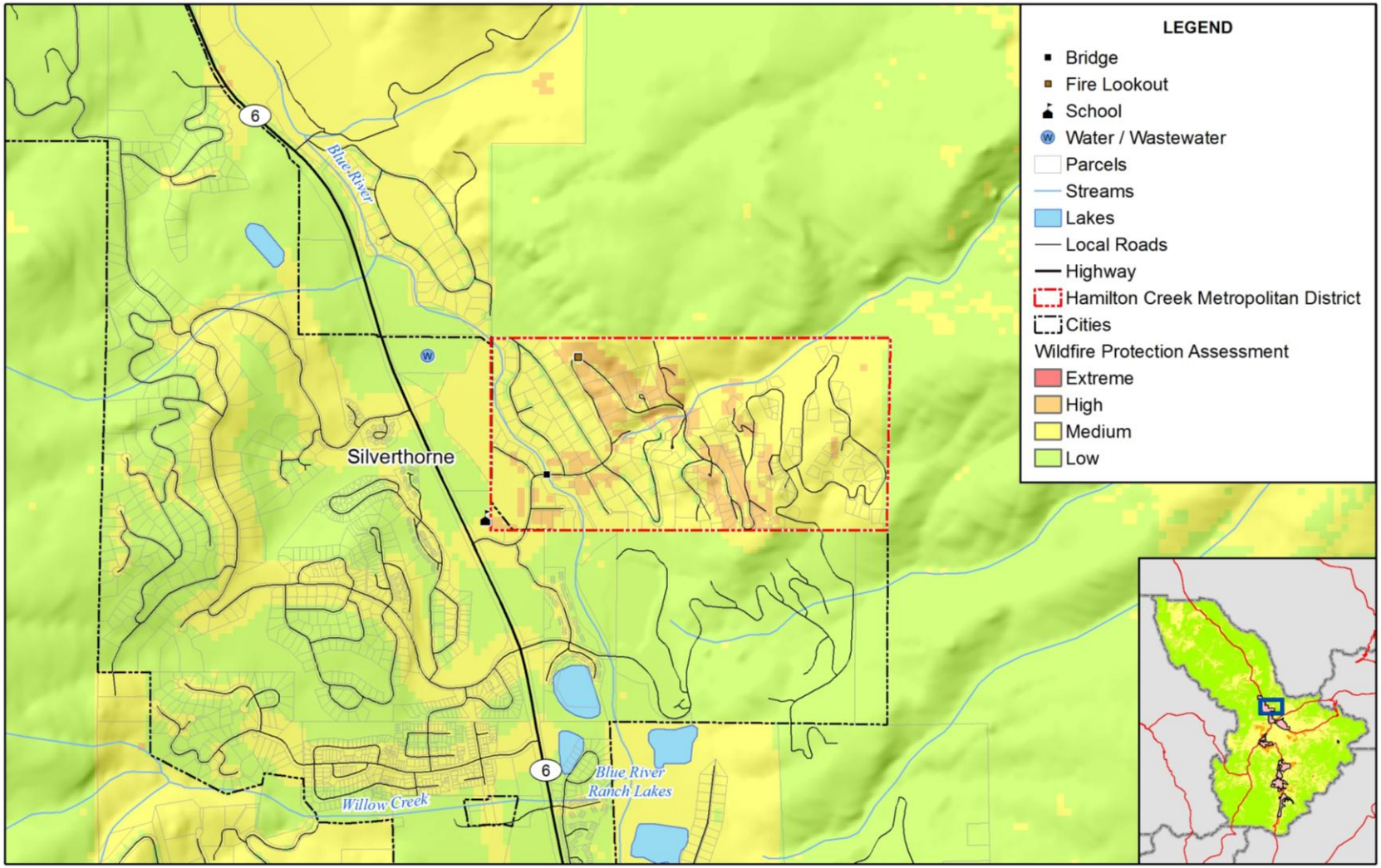
Based on the methodology described for wildfire in Section 3.3.3 Vulnerability by Hazard, the property values in HCMD were separated into wildfire threat zones. The breakdown of property values in HCMD by wildfire threat zone is shown in Table M.5. Most of the acreage in HCMD is in medium to high wildfire threat zones. These zones have the most property value at risk as well.

Table M.5. HCMD—Property Values in Wildfire Threat Zones

Threat Zone	Land Use	Improved Parcel Count	Land Value	Improved Value	Estimated Content Value	Total Value
Low	Residential	3	$752,409	$2,188,930	$1,094,465	$3,283,395
	Total	**3**	**$752,409**	**$2,188,930**	**$1,094,465**	**$3,283,395**
Medium	Mixed Use	10	$2,688,467	$3,137,924	$3,137,924	$6,275,848
	Residential	115	$33,042,400	$49,370,434	$24,685,217	$74,055,651
	Total	**125**	**$35,730,867**	**$52,508,358**	**$27,823,141**	**$80,331,499**
High	Mixed Use	2	$627,907	$1,212,936	$1,212,936	$2,425,872
	Residential	32	$10,470,296	$14,665,963	$7,332,982	$21,998,945
	Total	**34**	**$11,098,203**	**$15,878,899**	**$8,545,918**	**$24,424,817**
Grand Total		**162**	**$47,581,479**	**$70,576,187**	**$37,463,524**	**$108,039,711**

Source: AMEC analysis with County data

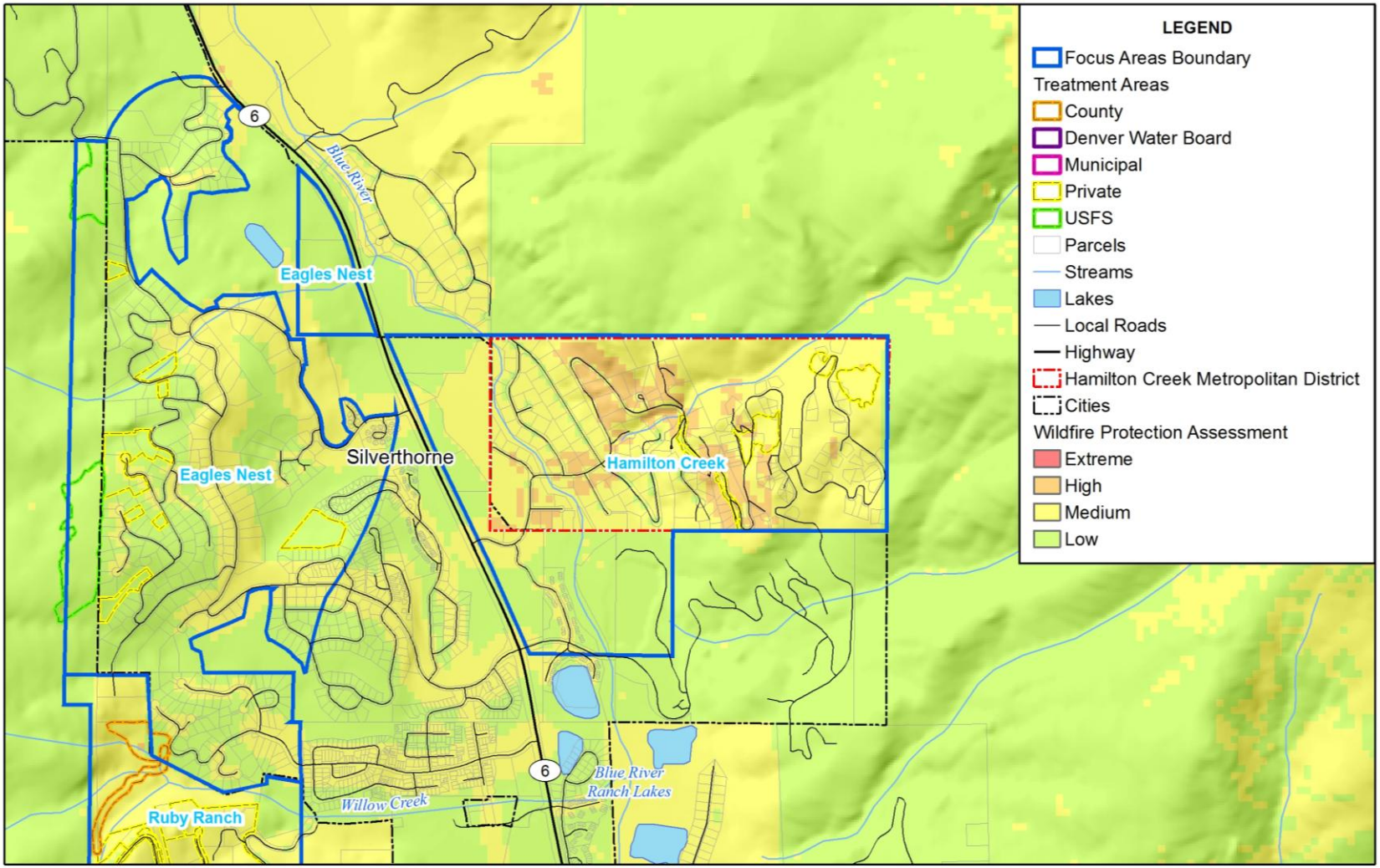
Figure M.2. Wildfire Threat and Critical Facilities in HCMD



amec

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County, HAZUS-MH 2.1

Figure M.3. Wildfire Focus Areas and Treatment Areas in HCMD



amec

0 0.5 1 Miles

N

Map compiled 6/2013; intended for planning purposes only.
Data Source: Summit County

The Lake Dillon FPD provides fire protection services to HCMD. The LDPFD 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 the 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 during the 2013 plan update.

M.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 M.6 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.6. 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	

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
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.7 identifies the personnel responsible for activities related to mitigation and loss prevention in HCMD.

Table M.7. HCMD—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	No		

Personnel Resources	Yes/No	Department/Position	Comments
use, building footprints, etc.)			
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.

Mitigation Outreach and Partnerships

- Meetings and newsletters regarding wildfire, drought, and evacuation

Past Mitigation Efforts

- Forest fuel reduction, alternate water sources

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

Jurisdiction:	Hamilton Creek Metropolitan District
Action Title:	Backup power connection
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:	New in 2013. In planning stages.

Mitigation Action: HCMD—2

Jurisdiction:	Hamilton Creek Metropolitan District
Action Title:	Water Supply Interconnect
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:	New in 2013.

Mitigation Action: HCMD—3

Jurisdiction:	Hamilton Creek Metropolitan District
Action Title:	Maintain existing wildfire mitigation efforts
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:	New in 2013.

Mitigation Action: HCMD—4

Jurisdiction:	Hamilton Creek Metropolitan District
Action Title:	Continue education and outreach about water conservation
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:	Electronic water meters installed in 2009.

Mitigation Action: HCMD—5

Jurisdiction:	Hamilton Creek Metropolitan District
Action Title:	Develop Source Water Protection Plan (SWPP)
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:	New in 2013

APPENDIX A: REFERENCES

2012 Community Profile. 2012. Town of Silverthorne.

2012 Report on the Health of Colorado's Forests. Colorado State Forest Service. http://csfs.colostate.edu/pdfs/137233-forestreport-12-www.pdf

American Community Survey. 2011. http://www.census.gov/acs/www/

Amman, Gene D., Mark D. McGregor, and Robert E. Dolph, Jr. Mountain Pine Beetle. U.S. Forest Service. Forest Insect & Disease Leaflet 2. 2002. www.barkbeetles.org/mountain/ fidl2.htm.

Annual Report for the Year 1998. Colorado Division of Water Resources. http://water.state.co .us/pubs/annualreport/Annlrpt98.pdf.

Atkins, Dale. A History of Colorado Avalanche Accidents, 1859–2006. International Snow Science Workshop 2006 Proceedings. 2006. www.avalanche.org/~issw2004/issw_previous/ 2006/proceedings/data/papers/044.pdf.

Berwyn, Bob. Remembering 'The Big One.' Summit Daily News February 15, 2007. www.summitdaily.com/.

Berwyn, Bob. 'The Big One'- Rescue, Recovery.' Summit Daily News. February 16, 2007. www.summitdaily.com/.

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

Breckenridge Town Code. Town of Breckenridge. www.townofbreckenridge.com/.

Census 2000 and 2010. U.S. Census Bureau. www.census.gov/.

Colorado Avalanche Information Center. Colorado Geological Survey. https://avalanche.state.co.us/index.php

Colorado Department of Labor and Employment. http://lmigateway.coworkforce.com/

Colorado Earthquake Evaluation Report. www.dola.state.co.us/dem/mitigation/plan_2007/ 2007_plan.htm.

Colorado Earthquake Information. Colorado Geological Survey. http://geosurvey.state.co.us/hazards/Earthquakes/Pages/Earthquakes.aspx.

Colorado Geological Survey. http://geosurvey.state.co.us/Pages/CGSHome.aspx.

Colorado Mountain Pine Beetle Epidemic 1996-2007. Colorado State Forest Service. 2008. http://csfs.colostate.edu/library/pdfs/iandd/2007_1996_StateOverview_I&D_MPB_AllForest Species.pdf.

Colorado Office of Emergency Management. http://www.coemergency.com/.

Colorado Scenic Byways. www.coloradoscenicbyways.com/.

Colorado's Common Forest Insects and Diseases. Colorado State Forest Service. http://csfs.colostate.edu/pages/common-insects.html .

Craddock, M. Shrine Pass Avalanche Kills Two. Sentinel (?). March 18, 1987.

Community Rating System. Federal Emergency Management Agency National Flood Insurance Program. http://www.fema.gov/national-flood-insurance-program-community-rating-system

Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies. Federal Emergency Management Agency. FEMA 386-3. 2003. www.fema.gov/plan/mit planning/howto3.shtm.

Dillon Municipal Code. Town of Dillon. http://www.townofdillon.com/index.aspx?page=145.

Directory of Colorado State Register Properties. Colorado Historical Society Office of Archeology and Historical Preservation. http://www.historycolorado.org/oahp/listings-county.

Drought Impact Reporter. National Drought Mitigation Center. http://droughtreporter.unl.edu/

Endangered, Threatened, Proposed and Candidate Species Colorado Counties. U.S. Fish and Wildlife Service Mountain-Prairie Region. August 2013. http://ecos.fws.gov/ipac/wizard/trustResourceList!prepare.action.

Farm Service Agency. U.S. Department of Agriculture. http://www.fsa.usda.gov/FSA/webapp?area=home&subject=diap&topic=landing

Federal Wildland Fire Occurrence Data. http://wildfire.cr.usgs.gov

Flood Insurance Study: Summit County, Colorado, Unincorporated and Incorporated Areas. Federal Emergency Management Agency. November 16, 2011.

Formosa, Nicole. Homes at Risk. Press Release. Town of Dillon, Colorado. February 24, 2006. www.townofdillon.com/.

Formosa, Nicole. Ophir Mountain Fire Area Dubbed "High Priority" by Officials. Summit Daily News. September 23, 2005. www.summitdaily.com/.

Formosa, Nicole. Sheriff's deputy awarded for rescuing boaters. Summit Daily News. August 19, 2007. www.summitdaily.com/.

Formosa, Nicole. Study Shows Dillon's Water Supply Is Adequate. March 16, 2006. www.summitdaily.com/.

Garner, J. Storm Sinks 6 Boats at Dillon. Rocky Mountain News. September 26, 1986.

Getting Started: Building Support for Mitigation Planning. Federal Emergency Management Agency. FEMA 386-1. 2002. www.fema.gov/plan/mitplanning/howto1.shtm.

Hamilton, Harriet. Storm Refugees Tell Stories of Being Trapped in Summit. Summit Daily News. December 31, 2007. www.summitdaily.com/.

Hazard Mitigation Planning and Hazard Mitigation Grant Program. Federal Register. Interim Final Rule. February 26, 2002. www.fema.gov/plan/mitplanning/interim_final_rules.shtm.

Hazard Mitigation Planning and Hazard Mitigation Grant Program. Federal Register. Final Rule. October 31, 2007.

HAZUS-MH 2.0 and 2.1. Federal Emergency Management Agency. www.fema.gov/plan/prevent/hazus/index.shtm.

Heeney/Green Mountain Reservoir Subbasin Plan. Summit County. 2006. http://summitstage.com/Planning/MasterPlans/PDFs/Heeney_GreenMountainReservoirSubbasinPlan.pdf.

Historic American Buildings Survey. National Park Service. www.nps.gov/history/hdp/habs/.

Historic American Engineering Record. National Park Service. www.nps.gov/history/hdp/haer/.

Introduction to Hazard Mitigation. Federal Emergency Management Agency. FEMA IS-393.A. 2006. http:// training.fema.gov/EMIWeb/IS/is393A.asp.

Kellogg, Karl S. Geologic Map of the Dillon Quadrangle, Summit and Grand Counties, Colorado. U.S. Geological Survey. http://pubs.usgs.gov/mf/2002/mf-2390/.

Kellogg, Karl S., Paul J. Bartos, and Cindy L. Williams. Geologic Map of the Frisco Quadrangle, Summit County, Colorado. http://pubs.usgs.gov/mf/2002/mf-2340/.

Kepler, William F. Nondestructive Testing of Reclamation Structures. Water Operation and Maintenance Bulletin. Bureau of Reclamation. March 2001. www.usbr.gov/pmts/infrastructure/inspection/waterbulletin/195mar2001.pdf.

Krusen, Lindsey. Frozen Culvert Causes Flooding in Summit Cove. Summit Daily News. February 17, 2007. www.summitdaily.com/.

Leatherman D.A., I. Aguayo, and T.M. Mehall. Mountain Pine Beetle. Colorado State University Extension. www.ext.colostate.edu/pubs/insect/05528.html.

Multi-Hazard Identification and Risk Assessment. Federal Emergency Management Agency. 1997. www.fema.gov/library/viewRecord.do?id=2214.

Multi-Hazard Mitigation Planning Guidance under the Disaster Mitigation Act of 2000. Federal Emergency Management Agency. Draft. 2007.

Multi-Jurisdictional Mitigation Planning. Federal Emergency Management Agency. FEMA 386-8. 2006. www.fema.gov/plan/mitplanning/howto8.shtm.

National Atlas. U.S. Geological Survey. www.nationalatlas.gov

National Flood Insurance Program. Federal Emergency Management Agency. http://www.fema.gov/national-flood-insurance-program.

National Flood Insurance Program (NFIP) Floodplain Management Requirements: A Study Guide and Desk Reference for Local Officials. Federal Emergency Management Agency. FEMA 480. http://www.fema.gov/floodplain-management/floodplain-management-requirements.

National Register of Historic Places. National Park Service. http://www.nps.gov/nr/research/.

National Response Center. www.nrc.uscg.mil/.

National Weather Service Lightning Safety. http://www.lightningsafety.noaa.gov/

Natural Diversity Information Source. Colorado Division of Wildlife. http://ndis.nrel.colostate .edu/.

Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities. National Institute of Building Science Multi-Hazard Mitigation Council. 2005. www.nibs.org/MMC/mmcactiv5.html.

Population Totals. Colorado Division of Local Government State Demography Office. http://www.colorado.gov/cs/Satellite?c=Page&childpagename=DOLA-Main%2FCBONLayout&cid=1251593346867&pagename=CBONWrapper.

Public Entity Risk Institute Presidential Disaster Declaration Site. Public Entity Risk Institute. www.peripresdecusa.org/mainframe.htm.

Risk Analysis Study of Hazardous Materials Trucks through Eisenhower/Johnson Memorial Tunnels. Colorado Department of Transportation. 2006. http://cospl.coalliance.org/fedora/repository/co:5086 .

Rogers, William P. Critical Landslides in Colorado a Year 2002 Review and Priority List. Colorado Geological Survey. 2004. www.dola.state.co.us/dem/mitigation/plan_2007/2002%20Landslide%20Update.pdf.

Robert T. Stafford Disaster Relief and Emergency Act. Public Law 93-288, as amended, 42 U.S.C. 5121-5207. June 2007. www.fema.gov/pdf/about/stafford_act.pdf.

Silverthorne Comprehensive Plan. 2008. Town of Silverthorne.

Silverthorne Town Code. Town of Silverthorne. http://www.silverthorne.org/index.aspx?page=354.

Spatial Hazard Events and Losses Database for the United States. University of South Carolina Hazards Research Lab. http://webra.cas.sc.edu/hvriapps/sheldus_web/sheldus_login.aspx.

Species Tracking Lists. Colorado Natural Heritage Program. http://www.cnhp.colostate.edu/download/list.asp.

State of Colorado Drought Mitigation and Response Plan. 2010 and 2013. http://cwcbweblink.state.co.us/WebLink/ElectronicFile.aspx?docid=145453&searchid=8b0c8c76-e047-4f46-8e09-7237713bddeb&dbid=0

State of Colorado Natural Hazards Mitigation Plan. Colorado Division of Emergency Management. 2011. http://www.dhsem.state.co.us/emergency-management/mitigation-recovery/mitigation/state-colorado-natural-hazards-mitigation-plan.

Storm Events Database. National Climatic Data Center. http://www.ncdc.noaa.gov/stormevents/.

Summit County Community Wildfire Protection Plan. Summit County Wildfire Council. 2006, revised 2013. http://www.co.summit.co.us/DocumentCenter/Home/View/403.

Summit County Comprehensive Plan. 2009. http://www.co.summit.co.us/index.aspx?NID=495.

Summit County Population Information. Summit County. http://www.co.summit.co.us/index.aspx?NID=243.

Town of Breckenridge. www.townofbreckenridge.com/.

Town of Breckenridge Emergency Operations Annex. Town of Breckenridge. 2005. www.townofbreckenridge.com/documents/page/Emergency%20Operations%20Annex%201228051.pdf.

Town of Breckenridge Comprehensive Plan. Town of Breckenridge. March 25, 2008. http://www.townofbreckenridge.com/Modules/ShowDocument.aspx?documentid=34.

Town of Dillon. www.townofdillon.com/.

Town of Silverthorne. www.silverthorne.org/.

Understanding Your Risks: Identifying Hazards and Estimating Losses. Federal Emergency Management Agency. FEMA 386-2. 2001. www.fema.gov/plan/mitplanning/howto2.shtm.

U.S. Drought Monitor Archives. University of Nebraska-Lincoln. http://droughtmonitor.unl.edu/archive.html

U.S. Geological Survey. http://www.usgs.gov/.

U.S. Seasonal Drought Outlook. National Weather Service Climate Prediction Service. www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html.

Western Regional Climate Center. www.wrcc.dri.edu/.

Wildfire Forces Evacuations in Summit County. TheDenverChannel.com. September 19, 2005. www.thedenverchannel.com/.

Wildfires Contained Along Front Range, Western Slope. TheDenverChannel.com. September 21, 2005. www.thedenverchannel.com/.

EMERGENCY MANAGEMENT

970-423-8911
fax 970-453-7329
Post Office Box 210
501 N. Park Street
Breckenridge, Colorado 80424

January 2, 2013

RE: Summit County Multi-Hazard Mitigation Plan Update

Summit County needs to update the multi-hazard mitigation plan which was originally approved by FEMA in 2008. The purpose of this multi-jurisdictional plan is to reduce or eliminate long-term risk to the people and property of Summit County from the effects of 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 in order to remain eligible for certain federal disaster assistance and mitigation funding programs.

Summit County Emergency Management has taken the lead in developing this plan update. The County has hired a consultant, AMEC Environment and Infrastructure, to manage the planning project. AMEC will facilitate the planning process, collect the necessary data, and perform other technical services, including updating the risk assessment and plan document. However, County Emergency Management and AMEC 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, municipalities, 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 where we will discuss the approach to updating plan, benefits of participation, the project schedule, and a review of the hazards that affect Summit County such as wildfire, flooding, drought, winter storms, and more.

Summit County Multi-Hazard Mitigation Plan Update Kickoff Meeting
Wednesday, January 30, 2013
1:30 pm-3:30 pm
County Commons, Buffalo Mountain Room, 0037 Peak One Drive, Frisco, CO 80443

Please respond as to whether or not you or your representative will be able to attend the kickoff meeting by contacting me at (970) 423-8911 or jcochran@co.summit.co.us. Thank you for your early attention and response to this important project. I look forward to seeing you on January 30.

Sincerely,

Joel Cochran

Joel Cochran
Director
jcochran@co.summit.co.us

SUMMIT COUNTY

MULTI HAZARD MITIGATION PLAN

2013 UPDATE

KICKOFF MEETING and HAZARD IDENTIFICATION UPDATE

Wednesday, January 30th, 2013
1:30 to 3:30 p.m.
County Commons, Buffalo Mountain Room, 0037 Peak One Drive, Frisco, CO

- **Introductions**
- **Mitigation, Mitigation Planning, and the Disaster Mitigation Act Requirements**
- **The Role of the Hazard Mitigation Planning Committee**
- **Overview of the existing Hazard Mitigation Plan**
- **Implementation Success Stories**
- **Objectives and Schedule for the Plan Update**
- **Review of Identified Hazards**
- **Coordinating with Other Agencies, Related Planning Efforts, and Recent Studies**
- **Planning for Public Involvement**
- **Information Needs and Project Website**
- **Questions and Answers/Adjourn**

SIGN-IN SHEET
SUMMIT COUNTY
LOCAL HAZARD MITIGATION PLAN PROJECT
HMPC Meeting #1 – KICKOFF MEETING

Wednesday, January 30, 2013 @ 1:30pm-3:30pm
County Commons, ~~Buffalo Mountain~~ Mt. Royal Room, 0037 Peak One Drive, Frisco, CO

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail
Steve Neamtz	Dillon Police	Chief	970-262-3402	Steve.Neamtz@dillon.co
Patricia Gavelda	Colorado OEM	Local Mitigation Plans Program Manager	970-749-8280	patricia.gavelda@state.co.us
Deanna Butterbaugh	Colorado OEM	Mitigation Specialist	720-852-6697	deanna.butterbaugh@state.co.us
Joel Cochran	Summit County EM	Emergency Manager	970-423-8911	jcochran@co.summit.co.us
Jeff Brislawn	AMEC	Project Manager	303-443-7839	Jeff.brislawn@amec.com
Hillary King	AMEC	Jr. Planner	303-820-4652	hillary.king@amec.com
Shellie Jetton	Buffalo Mountain	Manage	970-513-1300	shellie@BMMD.org
Lannis Miller	Bureau of Reclamation	Powerplant Supervisor	970-724-3538	LDMiller@usbr.gov
Dan Moroz	Copper Mtn Dist	Code Officer	9709682300	dmoroz@cmcmd.co
Dave Erickson	CMCMD	Manager	968.2537	dericksons@cmcmd.com
Lindsay Backas	Blue River	Mayor	970-485-1040	lbackas@cs.com
Ron Mentch	Snake River Water Dist East Dillon " "	Assistant Manager	970-390-6857	ron@eastdillon.com
Mark Thomson	CMCMD	Fire Chief	970-393-3604	mthomson@cmcmd.com
Julie Zangari	SASMC MVO	EP Coordinator	970-668-6944	JulieZangari@Centura.org

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail
Mike Koenig	Cm Consol Metro Dist	Pub. Work Dir	9704850534	mkoenig@cmcmdi.com
Sid Rivers	Planning - County	Planner	668-4215	sidR@co.summit.co.us
Scott O'Brien	Town of Dillon	PWD	970 262 3408	scotto@townofdillon.com
Mike McHargue	LCOEM	Emergency M.	719-221-0773	LCOEM@lakecounty.com
Brian Felt	Park Co OEM	Emergency Mgr	719 836 4272	bfelt@parkco.us
Bruce Hodson	Copper Mtn Resort	Ops Director	970-968-2318	bhodson@coppercolorado.com
Greg Morrison	Breck PD	Asst Chief	453-3177	gregm@breckgov.com
Lyn Hexford	Breck PD	Sgt.	547-1639	lynh@townofbreckenridge.com
Dave Parmley	Lake Dillon FPD	Chief	262-5110	dparmley@ldfr.org
Robert Jacobs	Summit County Engineering	County Engineer	970-668-4212	robertj@co.summit.co.us
Cale Osborn	Summit County SO	Spec Ops Sgt.	970-418-0035	cale@co.summit.co.us
Scott Hoffman	Summit Co Bldg Dept	Building Official	668-4082	scotth@co.summit.co.us

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail
Kevin McCormick	Snake River WWTP SCG	Operator III Safety	468-5794	kevinm@co.summit.co.u
James Phelps	Town of Breckenridge	Assistant PW Dir.	453.3181	jamesp@townofbreckenridg.co
Jay Nelson	RWBFPD	Deputy Chief	453 2474	jnelson@rwbfire.org
Bob Polich	East Dillon, Moon, Cortney Hamilton Creek, Dillon Vly	Administrator	668-5500	admin@eastdillon.com
Dan Gietzen	Town of Silverthorne	Town Engineer	262 7354	dgietzen@silverthorne.org
Charles Payne	Copper Mtn Resort	Risk Safety	471-5935	cpayne@coppercolorado.com
Rick Higgins	Town of Frisco	Asst P.W. Dir	418 5540	rickh@townoffrisco
Troy Wineland	CO DWR	Water Commissioner	355.4516	troy.wineland@state.co.u
Rebecca Martinez	Denver Water OEM	Manager EM OEM	303-607-3160	rebecca.martinez@denverwater.org
Jan Cranor	Denver Water OEM	OEM Specialist III		jan.cranor@denverwater.org
Travis Avery	Summit School District	Emergency Response Coor.	970 368 1017	travis_avery@summit.k12.co.u
DAN SCHRODER	CSU EXTENSION - SUMMIT CNTY	CSU EXTENSION AGENT	970 668 4140	dan.schroder@colostate.edu

SUMMIT COUNTY

MULTI HAZARD MITIGATION PLAN

2013 UPDATE

RISK ASSESSMENT and GOALS UPDATE MEETING

Thursday, April 11th, 2013
9:00 a.m. to 12:00 p.m.
1:30 to 4:30 p.m.
County Commons, Mt. Royal Room, 0037 Peak One Drive, Frisco, CO

- **Introductions**
- **Review of the Planning Process**
- **Review of Identified Hazards**
- **Vulnerability Assessment Update Results**
- **Capability Assessment Review**
- **Reviewing and Updating Plan Goals**
- **Public Involvement Activities**
- **Information Needs and Next Steps**
- **Questions and Answers/Adjourn**

SIGN-IN SHEET
SUMMIT COUNTY
HAZARD MITIGATION PLAN UPDATE PROJECT
HMPC Meetings #2&3 – RISK ASSESSMENT and GOALS Review/Update

Thursday, April 11th, 2013 @ 1:30pm-4:30pm
County Commons, Mt Royal Room, 0037 Peak One Drive, Frisco, CO

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail
JEFF BRISLAWN	AMEC	PROJECT MGR	303-820-4654	Jeff.brislawn@amec.com
JOEL COCHRAN	S-OEM	EM	970-423-8911	jcochrane@co.summit.co.us
SCOTT O'BRIEN	TOWN OF DILLON	PWD	970 262 3408	scotto@townofdillon.com
Lannis Miller	USBR	PS2	970 724 3538	lkmiller@usbr.gov
Julie Zangari	SASMC	EP coord	970 668 6944	JulieZangari@Centura.org
Kevin McCormick	SCG SNAKE RIVER WWTP	Op 3	970-468-5794	Kevinm@co.summit.co.us
Shellie Jetton	Buffalo Mountain Metro	Manager	970-513-1300	shellie@bmmd.org
Jay Nelson	RWBFPD	Deputy Chief	970 453 3474	jnelson@rwbfire.org
Ron Mentch	Snake River/East Dillon Water	Assistant Manager	970-390-6857	ron@eastdillon.com
Sid Rivers	Summit Co - Planning	Planner II	970-668-4215	sidr@co.summit.co.us
Robert Jacobs	Summit Co ENG	County Engineer	668 4212	robertj@ " "
Jeff Berino	Lake Dillon Fire	Deputy Chief	668 5104	jberino@ldfr.org
GREG MORRISON	BRECK POLICE	ASST. CHIEF	453.3177	gregm@breckgov.com
Bill Gibson	Frisco Community Development	Senior Planner	668-9121	billg@townoffrisco.com

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail
DAN SCHRODER	CSU Extension	Dir.	6684140	dan.schroder@colostate.edu
Bob Polich	East Dillon & others	Admin	666-5540	admin & assistant

SUMMIT COUNTY
MULTI HAZARD MITIGATION PLAN
2013 UPDATE
Mitigation Strategy Development Meeting

Date: May 9th, 2013
Time: 1:30-4:30pm
Location: County Commons, Mt. Royal Room, 0037 Peak One Drive, Frisco, CO

Agenda

1. Opening remarks and introductions
2. Review of the planning process and key issues from the risk assessment and capability assessment
3. Overview of revised goals and objectives
4. Review of possible mitigation activities and alternatives
5. Discuss criteria for mitigation action selection and prioritization
6. Review of progress on existing actions in the plan
7. Brainstorming Session: Development of new mitigation actions (group process)
8. Prioritize mitigation actions (group process)
9. Discuss plan implementation and maintenance
10. Discuss next steps and public involvement

SIGN-IN SHEET
SUMMIT COUNTY
HAZARD MITIGATION PLAN UPDATE PROJECT
HMPC Meeting #4 – Mitigation Strategy Review/Update

Thursday, May 9th, 2013 @ 1:30pm-4:30pm
County Commons, Mt Royal Room, 0037 Peak One Drive, Frisco, CO

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail
Scott O Brien	Town of Dillon	P W D	(970) 262 3408	scotto@townofdillon.com
Shellie Jetton	Buffalo Mountain Metro	Manager	970-513-1300	shellie@bmmd.org
Lannis Miller	USBR	PSA	970 724 3538	ldmiller@usbr.gov
Julie Zangari	SASMC	EP Coordinator	970 668 6944	julie.zangari@centura.org
Kevin McCormick	SCG Snake River WWTP	OP III	970-468-5794	kevin@co.summit.co.us
Chuck Vale	CO-OEM	Field Manager	970-846-3912	chuck.vale@state.co.us
Rebecca Martinez	Denver Water	Manager Emergency Response	303-607-3160	rebecca.martinez@denverwater.org
Jan Cranor	Denver Water	Emergency Mngt. Specialist III	303-628-6352	jan.cranor@denverwater.org
Sid Rivers	County-Planning	Planner II	668-4215	sidr@co.summit.co.us
Bob Polk	East Dillon	Admin	970 668 5510	admin@eastdillon.com
Jim Keating	R.W.B. Fire	Chief	970-453-1485	JKEATING@RWBFIRE.ORG
Jeff Brislawn	AMEC	Project Manager	303-704-5506	Jeff.brislawn@amec.com
Robert Jacobs	Summit County Eng.	County Engineer	970 668 4212	robertj@co.summit.co.us
Patricia Gavelda	Colorado OEM	Mitigation Plans (Local) Program Mgr.	970-749-8280	patricia.gavelda@state.co.us

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail
Dave Parmley	Lake Dillon FPD	Chief	(970)262-5110	dparmley@dfr.org
Joel Cochran	Summit OEM	Director	423-8911	jcochran@co.summit.co.us

JCochran

Subject:	Montezuma Preparedness mtg
Location:	Silver - Sunshine Cafe
Start:	Wed 6/5/2013 11:30 AM
End:	Wed 6/5/2013 1:00 PM
Recurrence:	(none)
Organizer:	JCochran

Meeting with Montezuma Trustee Carney on MHMP and wildfire concerns. The Town has no paid staff and it is not possible to attend meetings because of work commitments by the Trustees and Mayor.

1

JCochran

Subject:	Town of Montezuma meeting
Location:	Montezuma -
Start:	Tue 6/18/2013 7:00 PM
End:	Tue 6/18/2013 8:30 PM
Recurrence:	(none)
Organizer:	JCochran

Attended public Town Council meeting and discussed with Council and Mayor the MHMP process. As a group we discussed the hazards and risk assessment for the Town of Montezuma.

JCochran

Subject:	Montezuma site visits
Location:	Montezuma
Start:	Tue 7/2/2013 9:15 AM
End:	Tue 7/2/2013 11:45 AM
Recurrence:	(none)
Meeting Status:	Meeting organizer
Organizer:	JCochran

Site visit in town with Lake Dillon Fire Deputy Chief Berino to discuss wildfire mitigation strategies. The MHMP mitigation strategies were discussed with the Mayor and Mayor Pro-Tem. Trustee Carney was unable to attend but is writing the Town information on the data collection documentation for AMEC.

As part of the initial hazard identification process, members of the HMPC used a hazards worksheet to identify and rate the significance of a variety of possible hazards. Significance was measured in general terms, focusing on key criteria such as the geographic extent of the hazard, the probability of an event occurring, and the likely magnitude and severity levels. A data collection guide was used to collect hazard, risk and capabilities information from Summit County and the participating jurisdictions which was then integrated into this plan. A template of the data collection guide is provided here:

Local Hazard Mitigation Plan Update

Data Collection Guide

for

Summit County, Colorado

Hazard Mitigation Planning Committee (HMPC)

Prepared by

AMEC Environment and Infrastructure, Inc.

January 2013

Please complete by February 28th, 2013

Overview

The contents of this workbook have been designed to assist Summit County in collecting necessary background information to support the hazard mitigation planning process pursuant to the Federal Disaster Mitigation Act (DMA) of 2000. This includes a hazard identification and vulnerability assessment, an assessment of Summit County's current hazard mitigation capabilities, and an identification of potential mitigation projects that, if undertaken, could prevent or reduce future losses.

The essential information needed to support the planning process includes background information about Summit County; plans, technical studies, and data related to hazards and risks; current governing codes, ordinances, regulations, and procedures whose intent is to minimize future losses; and an assessment of the planning area's technical and organizational capabilities to perform hazard mitigation/loss prevention functions. It is important that the plan shows what Summit County is doing now to limit future disaster losses.

The planning process is heavily dependent on existing data to be supplied by each of the participants represented on the Hazard Mitigation Planning Committee (HMPC). The DMA plan development process does not require the development of new data, but requires ***existing data only.***

The goal of this process is to produce a hazard mitigation plan that meets Summit County's needs, as well as the requirements of DMA 2000 and that contains a list of updated projects that may be eligible for streamlined federal mitigation funding pre or post disaster.

What is Mitigation?

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).

Mitigation generally means reducing long-term risk from hazards to acceptable levels through predetermined measures accompanying physical development, for example: strengthening structures to withstand high winds or snow loads; elevating, removing or limiting development in flood-prone areas; clearing defensible space around residences in Wildfire Urban Interface (WUI) areas; or designing development away from areas of geological instability.

Mitigation is different from emergency preparedness or response. Preparedness concentrates on activities which make a person, place, or organization ready to respond to a disaster with

emergency equipment, food, emergency shelter, and medicine. Response activities may reduce damages, such as sandbagging during a flood, but this is a short term solution and requires advance warning and capabilities in place during the event. Mitigation of flood hazards through wise floodplain management is a long term solution.

Participation

The DMA planning regulations and guidance stress that each entity seeking the required FEMA approval of their mitigation plan must:

- Participate in the process;
- Detail areas within the planning area where the risk differs from that facing the entire area;
- Identify specific projects to be eligible for funding; and
- Have the governing board formally adopt the plan.

For HMPC members, 'participation' means the planning committee representatives will:

- Attend and participate in HMPC meetings;
- Provide available data that is requested of the HMPC coordinator;
- Review and provide/coordinate comments on the draft plans;
- Advertise, coordinate and participate in the public input process; and
- Coordinate the formal adoption of the plan by the governing board.

Data Collection Guide

This guide contains an explanation of the types of hazard mitigation/loss prevention data that is needed for the hazard mitigation planning process. This guide identifies specific requirements for the Risk Assessment Process, which includes the Hazard Identification, Vulnerability, and Capability Assessments as well as defines requirements for development of the Mitigation Strategy. Also review the existing Summit County Multi-Hazard Mitigation Plan (2008) as you go through the worksheets.

The worksheets have been developed to assist with the data collection. These need to be completed for each participating jurisdiction (one each for the county, town, city, or special district) that desires credit for participation in the 2013 update. The guide will serve two purposes:

- They will help facilitate the collection of the necessary information.
- They will function as evidence of "participation" in the planning process.

Each jurisdiction should utilize members of their planning subcommittee to complete this form.

Data collection guides are due on February 28TH to Jeff Brislawn (contact information below).

Project Reference

Summit County Point of Contact:
Joel Cochran
Summit County Emergency Management
501 North Park Avenue
PO Box 210
Breckenridge, CO 80424
Tel 970-423-8911
Fax 970-453-7329
jcochran@co.summit.co.us

AMEC Project Manager
Jeff Brislawn
Hazard Mitigation Lead/Sr Project Manager
AMEC Environment and Infrastructure, Inc.
1002 Walnut St., Suite 200
Boulder, CO 80302
Tel 303-820-4654
Fax 303-442-0616
jeff.brislawn@amec.com

Link to the existing **Summit County Multi-Hazard Mitigation Plan (2008)**:

http://www.co.summit.co.us/DocumentCenter/Home/View/242

The Risk Assessment Process

The risk assessment process includes three components: hazard identification, vulnerability assessment, and capability assessment. Data needs and worksheets for each of the risk assessment components are included in this guide.

Summit County Local Hazard Mitigation Plan
Worksheet #1: Hazard Identification Update

Name of Department/Jurisdiction: _____

Use this worksheet to identify possible hazards that may impact your jurisdiction. Hazards currently identified in the plan are listed. List others that may not be represented, where appropriate. Please rank according to the guidelines that follow the table. Use copies of Worksheet #2: Historic Hazard Event to provide evidence to justify your conclusions.

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance	Hazard Map? (Paper/GIS/ Source)
Avalanche					
Dam & Levee Failure					
Drought					
Earthquake					
Erosion/Deposition					
Flood (including ice jams)					
Hailstorm					
Hazardous Materials					
Landslide, Debris Flow/Mudflow and Rockfall					
Lightning					
Mountain Pine Beetle Infestation					
Tornado					
Wildland fires					
Windstorm					
Winter Storm and Blizzards					

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

Geographic Location/Spatial Extent:
Large: More than 50% of planning area affected
Medium: 25-50% of planning area affected
Small: 10-25% of planning area affected
Isolated: Less than 10% of planning area affected

Potential Magnitude:
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

Significance (your subjective opinion): Low, Medium, High

Prepared by: _____

Phone: _____

Email: _____

Please return worksheets by mail, email, or fax to:
Jeff Brislawn, AMEC Environment & Infrastructure
1002 Walnut St., Suite 200
Boulder, CO 80302
Fax (303) 442-0616 Phone (303) 820-443-7839
Email: Jeff.brislawn@amec.com

Summit County Local Hazard Mitigation Plan
Worksheet #2: Historic Hazard Event

Name of Department/Jurisdiction: _____

Please fill out one sheet for each significant hazard event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

Prepared by: _____

Phone: _____

Email: _____

Please return worksheets by mail, email, or fax to:
Jeff Brislawn, AMEC Environment & Infrastructure
1002 Walnut St., Suite 200
Boulder, CO 80302
Fax (303) 442-0616 Phone (303) 820-443-7839
Email: Jeff.brislawn@amec.com

Summit County Local Hazard Mitigation Plan
Worksheet #3: Vulnerability Assessment

Name of Department/Jurisdiction: _____

The purpose of this worksheet is to assess the vulnerable buildings, populations, critical facilities, infrastructure, and other important assets in your community by using the best available data to complete the table and questions that follow. Use the table on the next page to compile a detailed inventory of specific assets at risk including critical facilities and infrastructure; natural, cultural, and historical assets; and economic assets as defined below. These may include hospitals, fire stations, or historic buildings. In the hazard specific column of the asset inventory table, indicate if there is a specific hazard to which the asset is at risk.

Critical Facilities

FEMA generally defines four kinds of critical facilities:

- Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic, and/or water-reactive materials
- Hospitals, nursing homes, and housing likely to have occupants who may not be sufficiently mobile to avoid injury or death during a hazard event
- Police stations, fire stations, vehicle and equipment storage facilities, and emergency operations centers that are needed for emergency response activities before, during, and after a hazard event
- Public and private utility facilities that are vital to maintaining or restoring normal services to hazard areas before, during, and after a hazard event

FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. 'Essential facilities' are those that, if damaged, would have devastating impacts on disaster response and/or recovery. 'High potential loss facilities' are those that would have a high loss or impact on the community. Transportation and lifeline facilities are third category of critical assets; examples are provided below.

Essential Facilities	High Potential Loss Facilities	Transportation and Lifeline
- Hospitals and other medical facilities - Police stations - Fire station - Emergency Operations Centers	- Power plants - Dams/levees - Military installations - Hazardous material sites - Schools - Shelters - Day care centers - Nursing homes - Main government buildings	- Highways, bridges, and tunnels - Railroads and facilities - Bus facilities - Airports - Water treatment facilities - Natural gas facilities and pipelines - Oil facilities and pipelines - Communications facilities

Natural, Cultural, and Historical Assets

Natural resource assets may include wetlands, threatened and endangered species, or other environmentally sensitive areas. Historical assets include state and federally listed historic sites.

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as recreation or agriculture, whose losses or downtime would have severe impacts on the community and its ability to recover from disaster.

Asset Inventory

Name of Asset	Type*	Replacement value	Hazard Specific issues

*EF: Essential Facilities; LS: Life Safety Facilities; LL: Life line facilities; HCNA: Historic, cultural or natural assets; EA: Economic Asset

Additional Vulnerability Questions

Average depth of 100-year floodplain	
Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, or low-income.	
Describe growth and development trends and future growth areas and how they relate to hazard areas and vulnerability concerns/issues.	
Review Chapter 4 in the 2008 Summit County Multi-Hazard Mitigation Plan. Indicate what projects have been completed or are ongoing and describe how vulnerability has changed (or not) as a result of implementing successful mitigation actions.	

Prepared by: _____

Phone: _____

Email: _____

Please return worksheets by mail, email, or fax to:
Jeff Brislawn, AMEC Environment & Infrastructure
1002 Walnut St., Suite 200
Boulder, CO 80302
Fax (303) 442-0616 Phone (303) 820-443-7839
Email: Jeff.brislawn@amec.com

Summit County Local Hazard Mitigation Plan
Worksheet #4: Capability Assessment

Name of Department/Jurisdiction: _____

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete this worksheet and provide supporting documentation if possible.

Regulatory

The following planning and land management tools are typically used by local jurisdictions to implement hazard mitigation activities. Please indicate which your jurisdiction has in place. If your jurisdiction does not have this capability or authority, please indicate if a higher level of government has the authority. Also use the comments column to indicate how we can obtain a copy of the plan or document (i.e. available on the web (include address), will put on ftp, will e-mail or mail, will fax).

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan		
Zoning ordinance		
Subdivision ordinance		
Growth management ordinance		
Floodplain ordinance		
Other special purpose ordinance (stormwater, steep slope, wildfire)		
Building code		
Fire department ISO rating		
Erosion or sediment control program		
Stormwater management program		
Site plan review requirements		
Capital improvements plan		
Economic development plan		
Local emergency operations plan		
Other special plans		
Flood insurance study or other engineering study for streams		
Elevation certificates (for floodplain development)		
Other		

Administrative/Technical

Identify the technical and personnel resources responsible for activities related to hazard mitigation/loss prevention within your jurisdiction. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, please indicate so in the comments column.

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices			
Engineer/professional trained in construction practices related to buildings and/or infrastructure			
Planner/engineer/scientist with an understanding of natural hazards			
Personnel skilled in GIS			
Full time building official			
Floodplain manager			
Emergency manager			
Grant writer			
Other personnel			
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)			
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)			
Other			

Additional Capabilities Questions

Does your community have any hazard-related certifications, such as Storm Ready certification or Firewise Communities certification?	
Describe any past or ongoing public education or information programs, such as for responsible water use, earthquake or fire safety, household preparedness, or environmental education.	
Describe any other past or ongoing projects or programs designed to reduce disaster losses. These may include projects to protect critical facilities.	
Describe any funding sources that could be leveraged for mitigation. These could include stormwater utility fees, general fund revenue, or grant sources.	

Prepared by: _____

Phone: _____

Email: _____

Please return worksheets by mail, email, or fax to:
Jeff Brislawn, AMEC Environment & Infrastructure
1002 Walnut St., Suite 200
Boulder, CO 80302
Fax (303) 442-0616 Phone (303) 820-443-7839
Email: Jeff.brislawn@amec.com

OFFICE OF EMERGENCY MANAGEMENT

970-423-8911
fax 970-453-7329
Post Office Box 210
501 N. Park Street
Breckenridge, Colorado 80424

FOR IMMEDIATE RELEASE
May 28, 2013

Contact: Joel Cochran,
Summit County Office of Emergency Management
(970) 423-8911

PUBLIC INPUT OPPORTUNITY ON SUMMIT COUNTY MULTI-HAZARD MITIGATION PLAN

SUMMIT COUNTY, CO – The Summit County Office of Emergency Management is hosting an open house and workshop to present information and obtain input on reducing risk to natural disasters in Summit County. All interested parties are invited and encouraged at attend. The Multi-Hazards Planning Open House will be held on **Tuesday, July 9, 2013, between 5:00 and 7:30pm in the Buffalo Mountain Room, County Commons Building, located at 0037 Peak One Drive, Frisco, Colorado.**

The open house is part of the Summit County Multi-Hazard Mitigation Planning Project. Summit County; the towns of Breckenridge, Blue River, Dillon, Frisco, and Silverthorne; the special districts of Buffalo Mountain, Copper Mountain Consolidated Metropolitan District, Hamilton Creek Metropolitan District, Mesa Cortina Water and Sanitation, Dillon Valley Water, East Dillon Water, Lake Dillon Fire Rescue and Red, White and Blue Fire; and the Denver Water Board are developing a comprehensive Multi-Hazard Mitigation Plan to reduce the vulnerability of people and property in the County to the impacts of natural hazards and to become eligible for mitigation funding programs from the Federal Emergency Management Agency (FEMA).

The plan was first produced in 2008 and is being updated as required by FEMA by a Hazard Mitigation Planning Committee made up of representatives of the County and towns; state and federal agencies; fire protection districts; special districts, and other local stakeholders. The plan will address a comprehensive list of natural hazards—ranging from wildfire to flooding, severe winter weather, avalanche, and drought—and will assess the impacts of these hazards to communities in Summit County. The plan will also set goals and prioritize projects to reduce the impacts of future disasters on people and property in the County.

The meeting will be an open house format from 5:00 to 7:30 pm with a number of presentation stations. There will be no formal presentations during the open house. The purpose of the open house is to invite the public and stakeholders in the mitigation plan to 1) learn about the plan's purpose and benefits, 2) present the results of the countywide risk assessment, and 3) discuss community concerns and priorities for reducing risk to natural disasters.

Nationwide, taxpayers pay billions of dollars annually helping communities, organizations, businesses, and individuals recover from disaster. Some natural disasters are predictable and, in many cases, much of the damage can be reduced or even eliminated. FEMA has targeted natural disaster loss reduction as one of its primary goals. The Disaster Mitigation Act of 2000 requires local governments, including universities and special districts, to have a FEMA-approved hazard mitigation plan to be eligible for certain federal disaster

assistance and hazard mitigation funding programs.

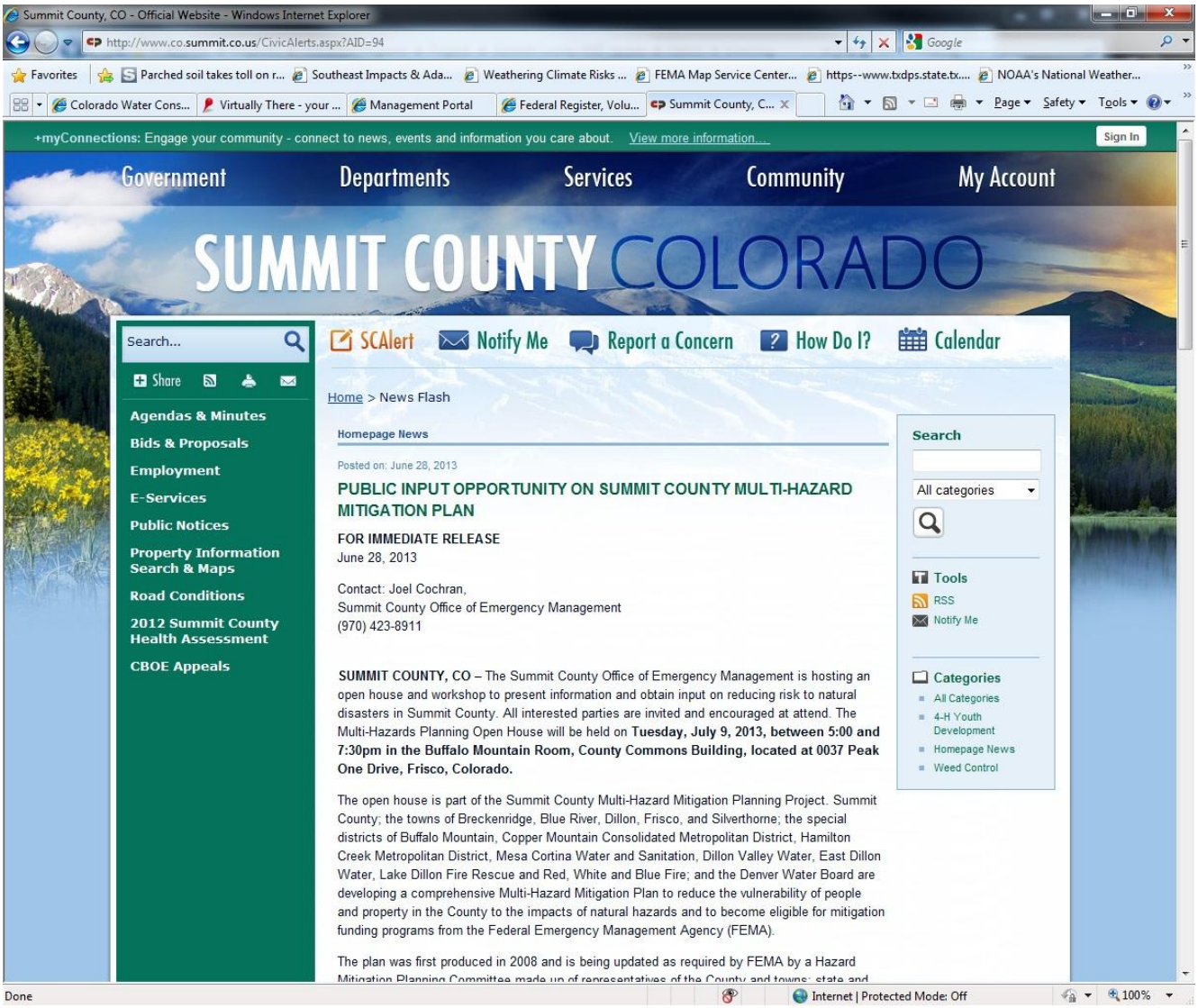
Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to human life and property from hazards. Natural hazard mitigation planning is the process by which natural hazards that threaten a community are identified, their likely impacts are assessed, mitigation goals are set, and appropriate strategies for reducing risk are developed, prioritized, and implemented.

The Summit County Office of Emergency Management is the lead agency in updating this plan under the direction of Emergency Manager Joel Cochran. Cochran has drawn on the expertise of consultants with AMEC Environment and Infrastructure, Inc., a firm that specializes in hazard mitigation and emergency management. The Office of Emergency Management and the consultants formed the Hazard Mitigation Planning Committee to facilitate development of the plan.

Feedback from the open house will be incorporated in the draft plan, as appropriate, which will be available for public review and comment. Upon approval by the Colorado Office of Emergency Management and FEMA, the plan will be presented to the Summit County Commissioners and the town council or other governing entity of each participating jurisdiction for formal adoption. For more information on this project, contact Joel Cochran at 970-423-8911 or at jcochran@co.summit.co.us.

###

Summit County, CO - Official Website - Windows Internet Explorer
http://www.co.summit.co.us/
+myConnections: Engage your community - connect to news, events and information you care about. View more information...
Sign In
Government
Departments
Services
Community
My Account
SUMMIT COUNTY COLORADO
Agendas & Minutes
Bids & Proposals
Employment
E-Services
Public Notices
Property Information Search & Maps
Road Conditions
2012 Summit County Health Assessment
CBOE Appeals
Register for SCAlert Community Notifications
Notify Me
Report a Concern
How Do I?
Calendar
News
Events
Popular Pages
SC Government Studies Ways to Reduce Costs While Maintaining Existing High Quality Ambulance Service
Read on...
PUBLIC INPUT OPPORTUNITY ON SUMMIT COUNTY MULTI-HAZARD MITIGATION PLAN
Read on...
Search...
Share
View Our Photo Gallery
Connect with Us
Twitter & Facebook
Home
Contact Us
Sitemap
Website Policies
Accessibility
Copyright
Powered by CivicPlus
Select Language
Done
Internet | Protected Mode: Off
100%


Summit County, CO - Official Website - Windows Internet Explorer
http://www.co.summit.co.us/CivicAlerts.aspx?AID=94
+myConnections: Engage your community - connect to news, events and information you care about. View more information....
Sign In
Government
Departments
Services
Community
My Account
SUMMIT COUNTY COLORADO
Search...
Share
Agendas & Minutes
Bids & Proposals
Employment
E-Services
Public Notices
Property Information Search & Maps
Road Conditions
2012 Summit County Health Assessment
CBOE Appeals
SCAlert
Notify Me
Report a Concern
How Do I?
Calendar
Home > News Flash
Homepage News
Posted on: June 28, 2013
PUBLIC INPUT OPPORTUNITY ON SUMMIT COUNTY MULTI-HAZARD MITIGATION PLAN
FOR IMMEDIATE RELEASE
June 28, 2013
Contact: Joel Cochran,
Summit County Office of Emergency Management
(970) 423-8911
SUMMIT COUNTY, CO – The Summit County Office of Emergency Management is hosting an open house and workshop to present information and obtain input on reducing risk to natural disasters in Summit County. All interested parties are invited and encouraged at attend. The Multi-Hazards Planning Open House will be held on Tuesday, July 9, 2013, between 5:00 and 7:30pm in the Buffalo Mountain Room, County Commons Building, located at 0037 Peak One Drive, Frisco, Colorado.
The open house is part of the Summit County Multi-Hazard Mitigation Planning Project. Summit County; the towns of Breckenridge, Blue River, Dillon, Frisco, and Silverthorne; the special districts of Buffalo Mountain, Copper Mountain Consolidated Metropolitan District, Hamilton Creek Metropolitan District, Mesa Cortina Water and Sanitation, Dillon Valley Water, East Dillon Water, Lake Dillon Fire Rescue and Red, White and Blue Fire; and the Denver Water Board are developing a comprehensive Multi-Hazard Mitigation Plan to reduce the vulnerability of people and property in the County to the impacts of natural hazards and to become eligible for mitigation funding programs from the Federal Emergency Management Agency (FEMA).
The plan was first produced in 2008 and is being updated as required by FEMA by a Hazard
Search
All categories
Tools
RSS
Notify Me
Categories
All Categories
4-H Youth Development
Homepage News
Weed Control
Done
Internet | Protected Mode: Off
100%

Summit County to hold open house on hazard mitigation plan | SummitDaily.com - Windows Internet Explorer

http://www.summitdaily.com/news/7188307-113/county-plan-summit-hazard

Favorites | Parched soil takes toll on r... | Southeast Impacts & Ada... | Weathering Climate Risks ... | FEMA Map Service Center... | https--www.txdps.state.tx.... | NOAA's National Weather...

Deltek Time & Expense - ... | Management Portal | Summit County to hol...

TRENDING: Reefer madness casts pall over Dillon Amphitheater show

SUMMIT DAILY Serving Summit County, CO

DAM GOOD BREWERY
DAM GOOD FOOD, BEER, FUN. Open Daily 11:30 am
ADVERTISEMENT

NEWS | OPINION | ENTERTAINMENT | MARKETPLACE

Classifieds | Jobs | Real Estate | Autos | Place Ad

BRAVO!VAIL JUNE 28 - AUG 3, 2013
PLAN FOR THE MUSIC YOU LOVE
DALLAS SYMPHONY ORCHESTRA | THE PHILADELPHIA ORCHESTRA
NEW YORK PHILHARMONIC | CHAMBER MUSIC SERIES
BUY NOW
bravovail.org | 877.612.5700
ADVERTISEMENT

Daily News staff report

NEWS
July 4, 2013
Follow News

Submit Your News

Summit County to hold open house on hazard mitigation plan

Article | Comments

Tweet

As officials prepare to update a 2008 Summit County hazard mitigation plan, they are asking for public input on the document at a public open house to be held from 5-7 p.m. Tuesday in the Buffalo Mountain Room in the County Commons building in Frisco.

Attendees will have an opportunity to learn about the plan, review the results of a countywide risk assessment and offer feedback on concerns and priorities for reducing the risk of natural disasters in the county.

The plan addresses the threat of disasters including wildfires, flooding, severe winter storms, drought and avalanches; it sets goals for reducing the impact of such events on community members and their property, according to a statement issued by the Summit County government.

Officials say the destruction caused by many natural events can be reduced or eliminated through preparation and planning, which have become primary goals of FEMA's.

Local entities participating in the development of the plan include the towns of Dillon, Breckenridge, Frisco, Silverthorne and Blue River, several special districts, Lake Dillon Fire-Rescue and the Red, White and Blue Fire Protection District and the Denver Water board.

Feedback gained during the open house will be included in the plan where appropriate. The final document will be made available for public review and comment, the release stated. It will be submitted to the Colorado Office of Emergency Management for approval, then to the leading bodies of each of the local agencies involved for adoption.

For more information on the project, contact county emergency manager Joel Cochran at (970) 423-8911 or at jcochran@co.summit.co.us.

INSIDE NEWS
- Crime
- Obituaries
- Regional
- Sports & Outdoors
- Announcements

Xcel Energy
SIGN UP for SAVER'S SWITCH TODAY
SIGN UP

JOBS

ick A-Peak Asphalt ... | Reporter. REPORT
19 | Jul 5, 2013 - ad id: 93459
k A-Peak Asphalt hiring driver. CDL ... | Reporter. REPORT a seven-day daily

View All

STEAL TODAY'S DEAL

Error on page. | Internet | Protected Mode: Off | 75%

Summit County updating its hazard mitigation plan | SummitDaily.com - Windows Internet Explorer

http://www.summitdaily.com/news/7213476-113/plan-county-hazards-cochran

Favorites | Parched soil takes toll on r... | Southeast Impacts & Ada... | Weathering Climate Risks ... | FEMA Map Service Center... | https--www.txdps.state.tx.... | NOAA's National Weather...

Deltek Time & Expense - ... | Management Portal | Summit County updati...

SUMMIT DAILY Serving Summit County, CO

DAM GOOD FOOD, BEER, FUN. Open Daily 11:30 am

NEWS | OPINION | ENTERTAINMENT | MARKETPLACE

Classifieds | Jobs | Real Estate | Autos | Place Ad

SERVICE MONKEY Wood & Gas Fireplace Professionals
CELEBRATING 20 YEARS OF SERVICE
Call to find out how you can make your home more safe and energy efficient
Licensed, Insured & Certified 970.262.1257 www.ServiceMonkeyFireplace.com

Breeana Laughlin
blaughlin@summitdaily.com
Follow Me

NEWS
July 6, 2013
Follow News

Submit Your News

Summit County updating its hazard mitigation plan

Article | Comments

Tweet

Summit County's emergency management director, Joel Cochran, is asking the public to help local governments identify the hazards of living in Summit County.

The plan is to cover everything from natural hazards like avalanches and wildfire to public health and infrastructure issues.

"These plans make a community focus on the hazards that can impact them," Cochran said. Once the hazards are identified, the community can come up with actions to lessen the risk.

Summit County has never had a presidentially declared disaster. Cochran said he'd like to keep it that way — but it's best for the community to be prepared should a disaster occur.

"We live in a beautiful place and we should enjoy that every day, but we should also be aware," he said.

The public can learn about and contribute to a multi-hazard mitigation plan during an open house and workshop on Tuesday. The plan will address a comprehensive list of natural hazards ranging from wildfire to flooding, severe winter weather, avalanche and drought.

if you go

- What: Multi-Hazards Planning Open House
- When: Tuesday, July 9, from 5-7:30 p.m.
- Where: Buffalo Mountain Room, County Commons Building, 0037 Peak One Drive, Frisco

INSIDE NEWS

- Crime
- Obituaries
- Regional
- Sports & Outdoors
- Announcements

Xcel Energy
HELP EVERYONE PEAK on ENERGY DEMAND DAYS
LEARN MORE

JOBS

Barista Part time. Experience a ...
Jul 5, 2013 - ad id: 9346357
Barista Part time. Experience a must. Needed ASAP! Apply within. 285 Main ...

View All

STEAL TODAY'S DEAL
$30 Gets You $50 at Breck Bike Guides on

Done, but with errors on page. | Internet | Protected Mode: Off | 75%

SIGN-IN SHEET
SUMMIT COUNTY
LOCAL HAZARD MITIGATION PLAN PROJECT
PUBLIC WORKSHOP

Tuesday, July 9th, 2013 @ 5:00pm-7:30pm
County Commons, Buffalo Mountain Room, 0037 Peak One Drive, Frisco, CO

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail
Lynn Twining	Frisco resident		cell 972/743-1414	LYNNJOHNTWINING@
John Twining	Frisco resident		cell 972/743-8117	SBC Global.Net
Pat + Bob Feuerriegel	Frisco Resident		(H) 970-668-0627	BobF3@ME.com
Tony Marzo	Frisco Resident			MARZO72211@YAHOO.com
Kathleen Martynowicz	Summit Cove Res.			
Jon Bader	Summit Cove Res			bader.1of4@gmail.com
Scott Toepfer	Colorado Air Info Center		453-7006	
Ellen Johnston	Frisco Resident		225-955-2431	sljjohn@gmail.com
Nowell Curran	Grand County OEM	EM Mgr	970-887-2732	ncurran@co.grand.co.us
Ray Jenning	Grand County EMS	EM Director	970-887-2732	rjennings@co.grand.co.us
Sheila Nerin	Frisco, Resident			
Nathan Nosari	Summit Cove Res		970 406 1895	
Shellie Jetton	Buffalo Mountain Metro	Manager	970-513-1300	shellie@bmmd.org

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail
Matthew Benedict	RWB Fire	Captain	970-390-9630	mbenedict@rwbfire.org
Joel Cochran	Summit OEM	EM	970-423-8911	jcochran@co.summit.co.us
Dan Schroder	Colorado State Univ. Extension	Director	970 668-4140	dan.schroder@yahoo.com
Breana Laughlin	Summit Daily News	Reporter	970 668 4617	breana4@yahoo.com
David Marez	Copper Fire Dept	Code Officer	970-968-2288	dmarez@concundi.co
Jeff Briskman	AMEC	Project Mgr	303-443-7838	Jeff.briskman@amec.com

Please complete this questionnaire and return by August 1, 2013 to:
Fax 970.453-7329 Attn: Joel Cochran
Mail: Summit County Emergency Management
P.O. Box 210
Breckenridge, CO 80424
jcochran@co.summit.co.us 970-423-8911

Summit County Multi-Hazard Mitigation Plan

Public input form

1. The hazards addressed in the Draft 2013 update of the Multi-Hazard Mitigation Plan are listed below. Please indicate the level of significance in Summit County that you perceive for each hazard. Please rate these hazards 1 through 3 as follows: 1=low, 2=moderate, 3=high.

- [3] Avalanche
- [1] Dam Failure
- [3] Drought
- [2] Earthquake
- [2] Erosion and Deposition
- [2] Flood/Ice Jams
- [3] Hazardous Materials spill/release
  Because of I70
- [3] Landslide/Rockfall/Debris Flow
- [2] Lightning
- [3] Mountain Pine Beetle Infestation
- [3] Severe Winter Weather
- [3] Wildfire
- [3] Windstorm

2. 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 (town, county, special district etc.).

egress from communities like Summit Cove (one entrance)

3. The following types of mitigation actions may be considered in Summit County. Please place a check ☒ next to the types of mitigation actions that you think should have the highest priority in the Summit County Multi-Hazard Mitigation Plan.

- [ ] Indoor/Outdoor Warning
- [x] Wildfire Fuels Treatment projects
- [x] Continued Participation in the National Flood Insurance Program
- [ ] Critical Facilities Protection
- [ ] Planning/Zoning
- [x] Public Education/Awareness
- [x] Flood mitigation
- [ ] Floodprone Property Buyout
- [x] Education and discounts on flood insurance
- [x] Avalanche mitigation
- [x] Landslide/mudslide mitigation
- [ ] Rockfall mitigation
- [x] Evacuation route development

4. Please comment on any other pre-disaster strategies that the planning committee should consider for reducing future losses caused by natural disasters (use the back of this form if needed).

1) Maybe door to door info distribution by qualified people for areas and communities with or/in significant hazards
2) Xcel should be invited to these events, they affect us all.

5. 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:

Jon Bader bader.1of4@gmail.com

Summit County Draft 2013 Update to the Multi Hazard Mitigation Plan: www.summit.co.us

Please complete this questionnaire and return by August 1, 2013 to:
Fax 970.453-7329 Attn: Joel Cochran
Mail: Summit County Emergency Management
P.O. Box 210
Breckenridge, CO 80424
jcochran@co.summit.co.us 970-423-8911

Summit County Multi-Hazard Mitigation Plan

Public input form

1. The hazards addressed in the Draft 2013 update of the Multi-Hazard Mitigation Plan are listed below. Please indicate the level of significance in Summit County that you perceive for each hazard. Please rate these hazards 1 through 3 as follows: 1=low, 2=moderate, 3=high.

- [1] Avalanche
- [1] Dam Failure
- [3] Drought
- [1] Earthquake
- [1] Erosion and Deposition
- [2] Flood/Ice Jams
- [2] Hazardous Materials spill/release
- [1] Landslide/Rockfall/Debris Flow
- [3] Lightning
- [1] Mountain Pine Beetle Infestation
- [2] Severe Winter Weather
- [3] Wildfire
- [2] Windstorm

2. 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 (town, county, special district etc.).

FIRE EMERGENCY PLAN, HOW NOTIFY RESIDENTS.
(FULL TIME TOWN OF FRISCO RESIDENT)

3. The following types of mitigation actions may be considered in Summit County. Please place a check ☒ next to the types of mitigation actions that you think should have the highest priority in the Summit County Multi-Hazard Mitigation Plan.

- ☒ Indoor/Outdoor Warning
- ☒ Wildfire Fuels Treatment projects
- ☐ Continued Participation in the National Flood Insurance Program
- ☒ Critical Facilities Protection
- ☐ Planning/Zoning
- ☐ Public Education/Awareness
- ☐ Flood mitigation
- ☐ Floodprone Property Buyout
- ☐ Education and discounts on flood insurance
- ☐ Avalanche mitigation
- ☐ Landslide/mudslide mitigation
- ☐ Rockfall mitigation
- ☒ Evacuation route development

4. Please comment on any other pre-disaster strategies that the planning committee should consider for reducing future losses caused by natural disasters (use the back of this form if needed).

5. 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:

ROBERT FENDRIZGEL BOBF3@ME.COM

Summit County Draft 2013 Update to the Multi Hazard Mitigation Plan: www.summit.co.us

Please complete this questionnaire and return by August 1, 2013 to:
Fax 970.453-7329 Attn: Joel Cochran
Mail: Summit County Emergency Management
P.O. Box 210
Breckenridge, CO 80424
jcochran@co.summit.co.us 970-423-8911

Summit County Multi-Hazard Mitigation Plan

Public input form

1. The hazards addressed in the Draft 2013 update of the Multi-Hazard Mitigation Plan are listed below. Please indicate the level of significance in Summit County that you perceive for each hazard. Please rate these hazards 1 through 3 as follows: 1=low, 2=moderate, 3=high.

- [3] Avalanche
- [2] Dam Failure
- [3] Drought
- [1] Earthquake
- [1] Erosion and Deposition
- [3] Flood/Ice Jams
- [3] Hazardous Materials spill/release
- [3] Landslide/Rockfall/Debris Flow
- [2] Lightning
- [3] Mountain Pine Beetle Infestation
- [3] Severe Winter Weather
- [3] Wildfire
- [3] Windstorm

2. 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 (town, county, special district etc.).

Summit Cove - community escape plan - only one way out?

3. The following types of mitigation actions may be considered in Summit County. Please place a check ☒ next to the types of mitigation actions that you think should have the highest priority in the Summit County Multi-Hazard Mitigation Plan.

- [x] Indoor/Outdoor Warning
- [ ] Wildfire Fuels Treatment projects
- [ ] Continued Participation in the National Flood Insurance Program
- [ ] Critical Facilities Protection
- [ ] Planning/Zoning
- [x] Public Education/Awareness
- [ ] Flood mitigation
- [ ] Floodprone Property Buyout
- [ ] Education and discounts on flood insurance
- [ ] Avalanche mitigation
- [ ] Landslide/mudslide mitigation
- [ ] Rockfall mitigation
- [x] Evacuation route development

4. Please comment on any other pre-disaster strategies that the planning committee should consider for reducing future losses caused by natural disasters (use the back of this form if needed).

reaching tourists and transient part year population

5. 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:

Summit County Draft 2013 Update to the Multi Hazard Mitigation Plan: www.summit.co.us

Please complete this questionnaire and return by August 1, 2013 to:
Fax 970.453-7329 Attn: Joel Cochran
Mail: Summit County Emergency Management
P.O. Box 210
Breckenridge, CO 80424
jcochran@co.summit.co.us 970-423-8911

Summit County Multi-Hazard Mitigation Plan

Public input form

1. The hazards addressed in the Draft 2013 update of the Multi-Hazard Mitigation Plan are listed below. Please indicate the level of significance in Summit County that you perceive for each hazard. Please rate these hazards 1 through 3 as follows: 1=low, 2=moderate, 3=high.

- [1] Avalanche
- [3] Dam Failure
- [3] Drought
- [3] Earthquake
- [2] Erosion and Deposition
- ? [ ] Flood/Ice Jams
- [2] Hazardous Materials spill/release
- [2] Landslide/Rockfall/Debris Flow
- [1] Lightning
- [3] Mountain Pine Beetle Infestation
- [1] Severe Winter Weather
- [3] Wildfire
- [1] Windstorm

2. 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 (town, county, special district etc.).

Fire – Notification of evacuation (How are summer only homeowners notified?

Summit/Frisco Summer resident

3. The following types of mitigation actions may be considered in Summit County. Please place a check ☒ next to the types of mitigation actions that you think should have the highest priority in the Summit County Multi-Hazard Mitigation Plan.

- [X] Indoor/Outdoor Warning
- [X] Wildfire Fuels Treatment projects
- [ ] Continued Participation in the National Flood Insurance Program
- [ ] Critical Facilities Protection
- [ ] Planning/Zoning
- [X] Public Education/Awareness
- [ ] Flood mitigation
- [ ] Floodprone Property Buyout
- [ ] Education and discounts on flood insurance
- [ ] Avalanche mitigation
- [ ] Landslide/mudslide mitigation
- [ ] Rockfall mitigation
- [X] Evacuation route development

4. Please comment on any other pre-disaster strategies that the planning committee should consider for reducing future losses caused by natural disasters (use the back of this form if needed).

5. 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:

Lynn + John Twining – LynnJohnTwining@SBCGlobal.Net

Summit County Draft 2013 Update to the Multi Hazard Mitigation Plan: www.summit.co.us

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					■			

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
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		■		■	■		■	■
Wetlands 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
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					■			

Mitigation Action Selection and Prioritization Criteria

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

Table D.1 HMPC Contact List

Name	Department	Email	Phone
Summit County			
Breakstone, Beverly	Summit County Assessor	beverlyb@co.summit.co.us	970-453-3492
Curnutte, Jim	Summit County Community Development	jimc@co.summit.co.us	970-668-4203
Cochran, Joel	Summit County OEM	jcochran@co.summit.co.us	970-423-8911
Ferris, Rich	Summit County GIS	richf@co.summit.co.us	970-668-4222
FitzSimons, Jaime	Summit County Operations Division	jamief@co.summit.co.us	970-453-2232
Hoffman, Scott	Summit County Building Department	scotth@co.summit.co.us	970-668-4082
Jacobs, Robert	Summit County Engineering	robertj@co.summit.co.us	970-668-4212
Noll, Thad	Summit County Manager's Office	thadn@co.summit.co.us	970-453-3438
Osborn, Cale	Summit County Sheriff's Office	caleo@co.summit.co.us	970-418-0635
Polhemus, John	Summit County Road and Bridge	johnp@co.summit.co.us	970-668-4231
Rivers, Sid	Summit County Planning	sidr@co.summit.co.us	970-668-4215
Schroder, Dan	Summit County CSU Extension	dan.schroder@colostate.edu	970-668-4140
Woodman, Derek	Summit County Sheriff's Office	derekw@co.summit.co.us	970-453-2232
Town of Blue River			
Backas, Lindsay	Town of Blue River Mayor	lbackas@cs.com	970-485-1040
Town of Breckenridge			
Herford, Lyn	Town of Breckenridge Police Department	lynh@townofbreckenridge.com	970-547-1639
Morrison, Greg	Town of Breckenridge Police Department	gregm@breckgov.com	970-453-3137
Phelps, James	Town of Breckenridge Public Works	jamesp@townofbreckenridge.com	970-453-3181
Town of Dillon			
Brady, Brian	Town of Dillon Police Department	brianb@townofdillon.com	970-262-3402
O'Brien, Scott	Town of Dillon Public Works	scotto@townofdillon.com	970-262-3408
Town of Frisco			
Gibson, Bill	Town of Frisco Community Development	billg@townoffrisco.com	970-668-9121
Higgins, Rick	Town of Frisco Public Works	rickh@townoffrisco.com	970-418-5540
Town of Montezuma			
Steve Hornback	Town of Montezuma Mayor	hstephen21@gmail.com	970-468-8509
Town of Silverthorne			
Gietzen, Daniel	Town of Silverthorne Public Works	dgietzen@silverthorne.org	970-262-7354

Name	Department	Email	Phone
Hanschmidt, Mark	Town of Silverthorne Police Department	mhanschmidt@silverthorne.org	970-262-7332
Fire Protection Districts			
Berino, Jeff	Lake Dillon FPD	jberino@ldfr.org	970-262-5104
Parmley, Dave	Lake Dillon FPD	dparmley@ldfr.org	970-262-5110
Keating, Jim	Red, White, and Blue FPD	jkeating@rwbfire.org	970-453-1485
Nelson, Jay	Red, White, and Blue FPD	jnelson@rwbfire.org	970-453-2474
Special Districts			
Jetton, Shellie	Buffalo Mountain Metropolitan District	shellie@BMMD.org	970-513-1300
Erickson, Dave	Copper Mountain Consolidated Metropolitan District	derickson@cmcmdi.com	970-968-2537
Koenig, Mike	Copper Mountain Consolidated Metropolitan District	mkoenig@cmcmdi.com	970-485-0554
Moroz, Dan	Copper Mountain Consolidated Metropolitan District	dmoroz@cmcmdi.com	970-968-2300
Thomson, Mark	Copper Mountain Consolidated Metropolitan District	mthomson@cmcmdi.com	970-393-3604
Cranor, Jan	Denver Water OEM	jan.cranor@denverwater.org	303-607-3160
Martinez, Rebecca	Denver Water OEM	Rebecca.Martinez@denverwater.org	303-607-3160
Mentch, Ron	East Dillon Water District/Snake River Water District	ron@eastdillon.com	970-390-6857
Polich, Bob	East Dillon Water District/Dillon Valley District/Mesa Cortina Water and Sanitation District/Hamilton Creek Metropolitan District	admin@eastdillon.com	970-668-5500
McCormick, Kevin	Snake River Wastewater Treatment Plant	kevinm@co.summit.co.us	970-468-5794
Other Partners and Stakeholders			
Wineland, Troy	Colorado Division of Water Resources	troy.wineland@state.co.us	970-355-4516
Butterbaugh, Deanna	Colorado OEM	deanna.butterbaugh@state.co.us	720-852-6697
Gavelda, Trish	Colorado OEM	patricia.gavelda@state.co.us	970-749-8280
Vale, Chuck	Colorado OEM	chuck.vale@state.co.us	970-846-3912
Cada, Paul	Colorado State Forest Service	Paul.Cada@colostate.edu	970-881-3121
Cousineau, Ron	Colorado State Forest Service	ron.cousineau@colostate.edu	970-887-3121
Houck, Kevin	Colorado Water Conservation Board	kevin.houck@state.co.us	303-866-3441 x3219
Hodson, Bruce	Copper Mountain Resort	bhodson@coppercolorado.com	970-968-2318
Payne, Charlie	Copper Mountain Resort	cpayne@coppercolorado.com	970-471-5935
McHargue, Mike	Lake County OEM	LCEM@LakeCountyEM.org	719-486-1249
Foltz, Brian	Park County OEM	bfoltz@parkco.us	719-836-4332

Name	Department	Email	Phone
Zangari, Julie	St. Anthony Summit Medical Center	juliezangari@centura.org	970-668-6944
Miller, Lannis	U.S. Bureau of Reclamation	LDMiller@usbr.gov	970-724-3538
Avery, Travis	Summit School District	travis_avery@summit.k12.co.us	970-368-1017
Wilmore, Ross	U.S. Forest Service	rwilmore@fs.fed.us	970-328-5867
Bartels, Tracy	Vail Resorts	TBartels@vailresorts.com	
AMEC Planning Team			
Jeff Brislawn	AMEC	jeff.brislawn@amec.com	303-443-7839
Hillary King	AMEC	hillary.king@amec.com	303-820-4652
Mack Chambers	AMEC	mack.chambers@amec.com	303-820-4663
Geoff Butler	Alpenfire LLC	gbutler@alpenfire.com	970-217-8495

APPENDIX E: PLAN ADOPTION

Note: The records of adoption will be incorporated as an electronic appendix. When the plan is adopted in 2013, 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 2013

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 Office of Emergency Management and Federal Emergency Management Agency, Region VIII officials to enable the Plan's final approval.*

Passed: ___(date)___

_____

Certifying Official