



Hinsdale County Hazard Mitigation Plan 2019 Update

November 2019



wood.

Hinsdale County Hazard Mitigation Plan 2019 Update

November 2019

wood.

TABLE OF CONTENTS

SECTION 1 - INTRODUCTION	1-1
1.1 Purpose	1-1
1.2 Background and Scope.....	1-1
1.3 Multi-Jurisdictional Planning	1-2
1.4 Plan Organization.....	1-2
SECTION 2 – COMMUNITY PROFILE	2-1
2.1 Geography and Climate.....	2-1
2.2 History	2-4
2.3 Population.....	2-6
2.4 Government.....	2-7
2.4.1 Hinsdale County Government.....	2-7
2.4.2 Town of Lake City Government	2-8
2.5 Economy	2-8
2.6 Capability Assessment.....	2-9
2.6.1 Planning and Regulatory Mitigation Capabilities.....	2-9
2.6.2 Administrative and Technical Mitigation Capabilities	2-14
2.6.3 Financial Mitigation Capabilities	2-16
2.6.4 Public Education and Outreach Mitigation Capabilities	2-17
2.6.5 Special Districts, Stakeholder Agencies, and Other Mitigation partnerships.....	2-19
2.6.6 Opportunities for Enhancement.....	2-22
SECTION 3 – PLANNING PROCESS	3-1
3.1 Background on Mitigation Planning in Hinsdale County.....	3-1
3.1.1 What’s New in the Plan Update	3-1
3.1.2 2014 Plan Section Review and Analysis	3-2
3.2 Local Government Participation.....	3-2
3.3 The 10-Step Planning Process	3-2
3.3.1 Phase 1: Organize Resources.....	3-4
3.3.2 Phase 2: Assess Risks	3-9
3.3.3 Phase 3: Develop the Mitigation Plan.....	3-10
3.3.4 Phase 4: Implement the Plan and Monitor Progress	3-10
SECTION 4 – RISK ASSESSMENT	4-1
4.1 Hazard Identification and Prioritization	4-2
4.1.1 Methodology and Results.....	4-2
4.1.2 Disaster Declaration History	4-4
4.1.3 Overview of Hazard Identification and Risk Assessment	4-6
4.2 Assets Summary	4-7
4.2.1 Methodology	4-7
4.2.2 Assets Exposure	4-7
4.2.3 Development and Population Trends.....	4-17
4.3 Hazard Analysis and Risk Assessment	4-19
4.3.1 Avalanche	4-19
4.3.2 Dam Incidents.....	4-29
4.3.3 Drought.....	4-40
4.3.4 Earthquake.....	4-50



4.3.5 Flooding	4-66
4.3.6 Landslides, Debris Flow, and Rockfall	4-83
4.3.7 Severe Thunderstorm Activity	4-92
4.3.8 Severe Winter Storms	4-104
4.3.9 Wildfires	4-111
4.3.10 Imminent Threat/Terrorism	4-126
4.3.11 Hazardous Materials Incidents	4-129
4.3.12 Pandemic Influenza	4-135
4.3.13 Utility Failure	4-140
4.3.14 Transportation Accidents	4-146
SECTION 5 – MITIGATION STRATEGY	5-1
5.1 Mitigation Strategy: Overview	5-1
5.1.1 Goals and Objectives	5-1
5.2 Identification and Analysis of Mitigation Actions	5-3
5.2.1 Prioritization Process	5-4
5.3 Mitigation Action Plan	5-5
5.3.1 Progress on Previous Mitigation Actions	5-5
5.3.2 Updated Action Plan	5-6
SECTION 6 - PLAN ADOPTION	6-1
SECTION 7 - PLAN IMPLEMENTATION AND MAINTENANCE	7-1
7.1 Implementation	7-1
7.1.1 Role of the Hazard Mitigation Planning Committee in Implementation and Maintenance	7-2
7.2 Maintenance/Monitoring	7-2
7.2.1 Maintenance/Monitoring Schedule	7-2
7.2.2 Maintenance Evaluation Process	7-3
7.2.3 Incorporation into Existing Planning Mechanisms	7-4
7.2.4 Continued Public Involvement	7-4



SECTION 1 INTRODUCTION

1.1 Purpose

Hinsdale County, Colorado, including the participating jurisdiction of the Town of Lake City have 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 community's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This plan was also developed to make Hinsdale County and the Town of Lake City eligible for certain federal disaster assistance, specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Assistance (HMA) grants including the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) and Pre-Disaster Mitigation (PDM) program, as well as to make the County and Lake City more disaster resistant. This plan demonstrates the County's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources.

1.2 Background and Scope

Each year in the United States, disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. 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 disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated.

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

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

This plan underwent a comprehensive update in 2019 in fulfillment of the five-year update requirement. This plan was originally prepared in 2003, 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 went through a plan update process in 2014. Hereafter, these requirements and regulations will be referred to collectively as the Disaster



Mitigation Act, or DMA. While the act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). Because the Hinsdale County planning and response area is subject to many kinds of hazards, access to these programs is vital.

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

1.3 Multi-Jurisdictional Planning

In Lake City/ Hinsdale County there are several governmental and service agencies providing services and decision-making bodies making decisions. Communication and coordination between such governments and agencies with respect to services, activities and plans are essential and beneficial to minimize duplication of efforts and, more generally, to protect and enhance the quality of life in the community; this is especially important between the Town of Lake City and Hinsdale County.

Without expecting that either the Town or the County will relinquish its authority and responsibilities to the other, the Town and County will cooperate as described in the Lake City/Hinsdale County Community Plan.

1.4 Plan Organization

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

- Section 1: Introduction
- Section 2: Community Profile
- Section 3: Planning Process
- Section 4: Risk Assessment
- Section 5: Mitigation Strategy
- Section 6: Plan Adoption
- Section 7: Plan Implementation and Maintenance
- Appendix A: Hazard Mitigation Planning Committee
- Appendix B: Planning Process Documentation
- Appendix C: Plan Adoption



SECTION 2 COMMUNITY PROFILE

2.1 Geography and Climate

Hinsdale County is located in southwestern Colorado approximately 275 miles south west of Denver. The County is the third least densely populated county of the 64 counties in the State of Colorado and one of the most remote counties in the United States. Hinsdale County includes one incorporated community (Town of Lake City) and several small unincorporated communities such as Cathedral & Debs. Hinsdale County is home to almost 18 subdivisions with many of those located within the Wildland Urban Interface (WUI).

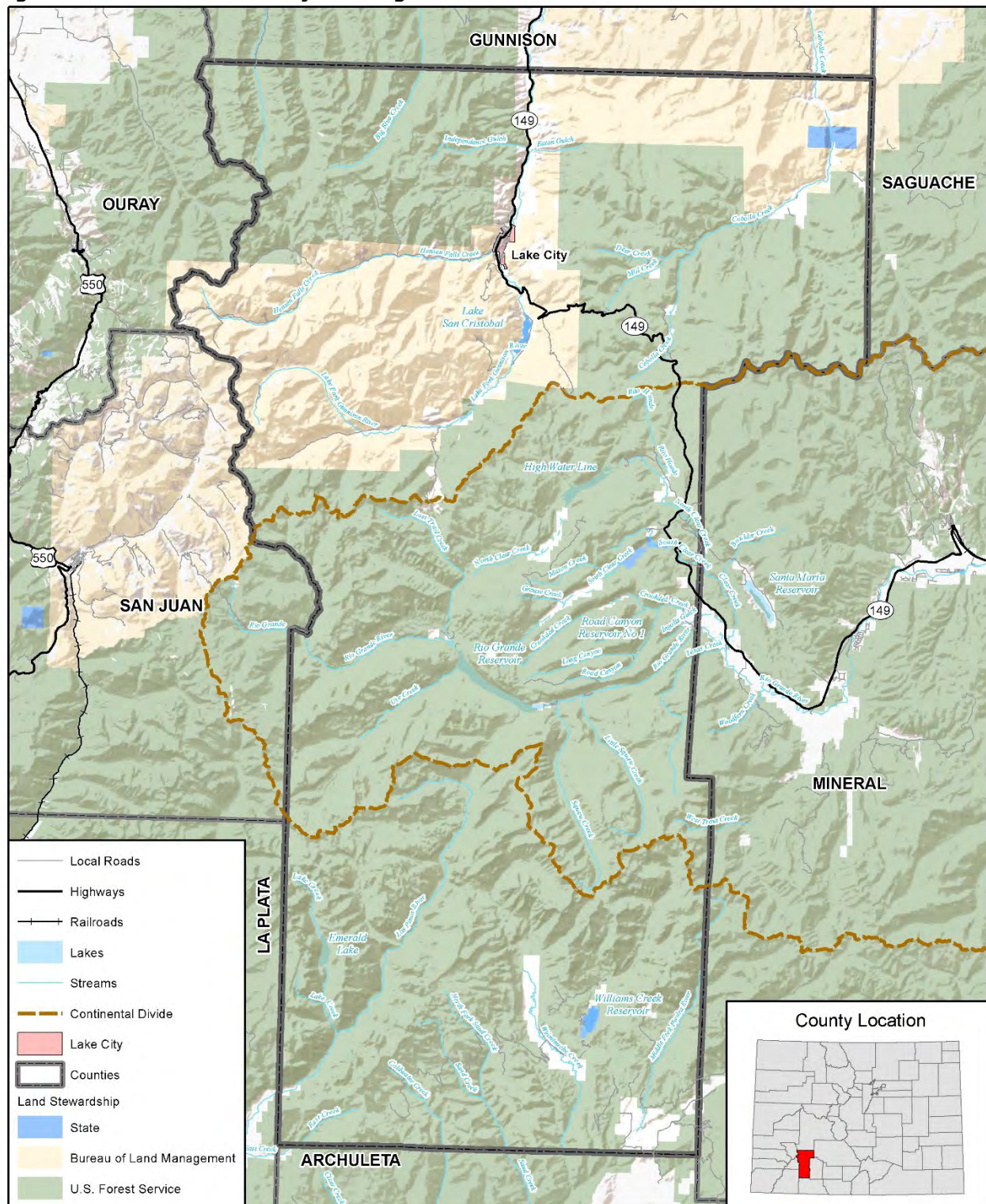
The Town of Lake City is located at the north central portion of Hinsdale County, 4 miles north of Lake San Cristobal, the second largest natural lake in Colorado. The Town of Lake City is situated at the confluence of the Henson Creek and the Lake Fork of the Gunnison River in a narrow north-south oriented valley. Access to Lake City is via highway 149, the only access to the Lake Fork of the Gunnison River Valley.

The county is covered by mountains, including multiple fourteeners, and contains one of the most roadless areas in the country. Hinsdale County has over 252 miles of roads to maintain, not including several more miles of trails. The continental divide crosses the county twice. The county is divided by three national forests (San Juan, Rio Grande, and Grand Mesa Uncompahgre Gunnison), four wilderness areas (Weminuche, Powderhorn, Uncompahgre, and La Garita), two wilderness study areas (Handies and Redcloud Peak) and one Bureau of Land Management Office. The county's location within the Rio Grande and the Lake Fork of the Gunnison River basins, provide significant hazards of flooding from these two rivers particularly in May and June during severe weather events when snowmelt is at its peak. The steepness of the San Juan Mountains, with much of the terrain over 45-degree pitches, makes Hinsdale one of the most avalanche prone areas in the lower 48 states as well as prone to flooding, landslides and rockfall.

Hinsdale County has over 332 miles of waterways and has combined water storage of 152,723-acre feet in reservoirs and lakes. Significant waterways include the headwaters of the Rio Grande River, the Lake Fork of Gunnison River, Cebolla Creek, and Henson Creek. There are several smaller rivers and creeks including the Upper Piedra River, Clear Creek, Little Squaw Creek, Trout Creek, Devils Creek, Cottonwood Creek, North Clear Creek, Big Spring Creek, South Clear Creek, Bear Creek, Crooked Creek, Lost Trail Creek, Texas Creek, Ute Creek, Weminuche Creek, Willow Creek and hundred miles of streams and ditches. In addition to Lake San Cristobal - Hinsdale also has Continental Reservoir, Rio Grande Reservoir, Williams Creek Reservoir, Rito Hondo Reservoir, Santa Maria Reservoir, Road Canyon Reservoir, Trail Ridge Reservoir, S Lazy U Reservoir and many smaller lakes.

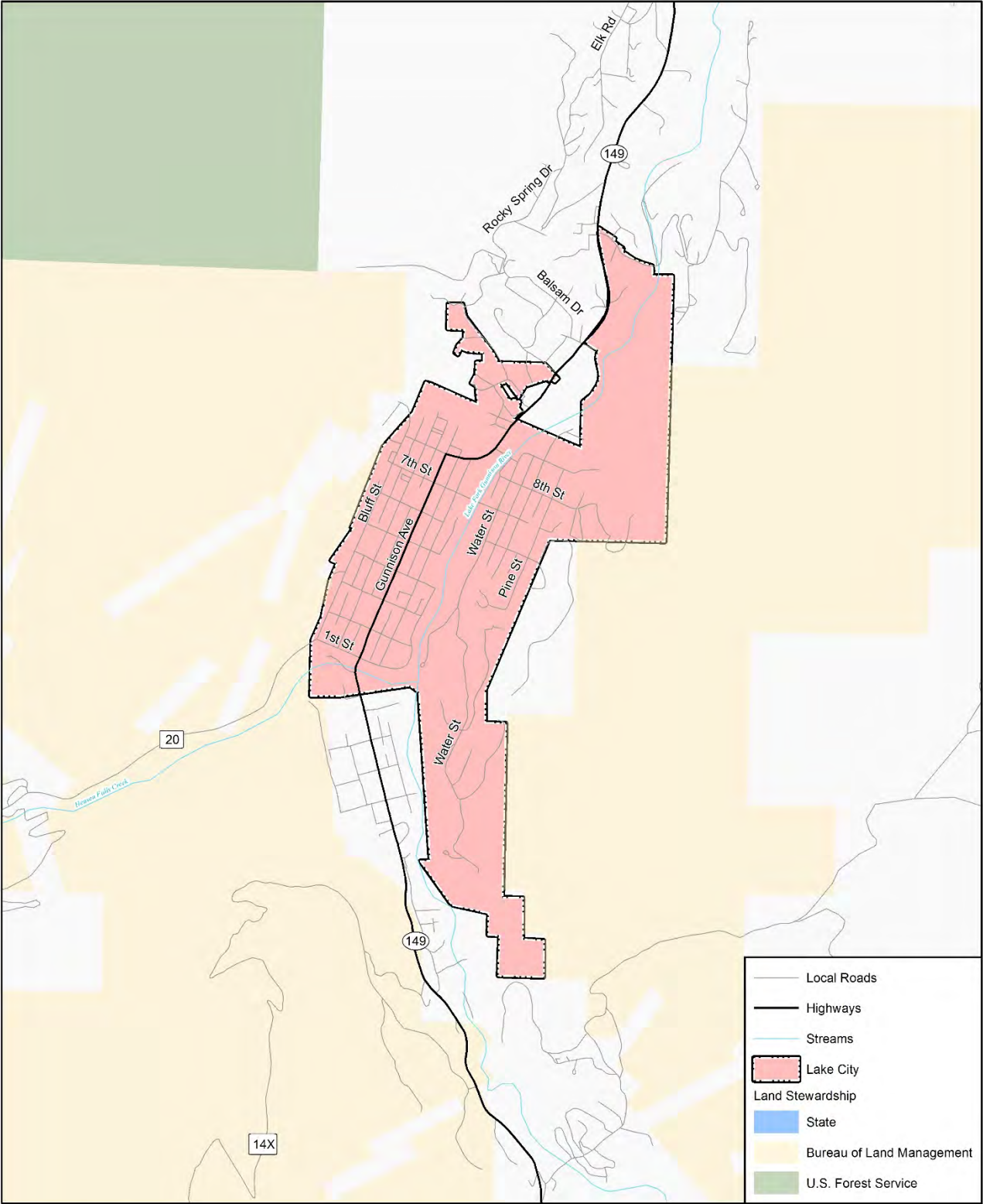
Figure 2-1 and Figure 2-2 below depict the Planning Area:

Figure 2-1 Hinsdale County Planning Area



wood. Map compiled 4/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, CO BLM,
ESRI World Terrain Basemap

Figure 2-2 Town of Lake City Planning Area



wood. Map compiled 5/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, CO BLM

Hinsdale County's geographic location and variations of elevation are the primary weather influencing factors. With 272 sunny days in an average year and a temperature spread of 77 degrees Fahrenheit to -2 degrees during that same period, the area is an outdoor enthusiast's delight regardless of the season. Precipitation averages 14 inches of rain per year and 93 inches of snow. Averages, of course, obscure the drought years, the years of exceptional snowfall and the summers with heavy monsoon rains. The county's vast forested areas are well adapted to the local climate; however, a combination of environmental and forest composition factors has aligned to support an epidemic outbreak of the spruce bark beetles, a blight that will alter the landscapes for decades to come. These factors include consecutive drought years, large dense stands of mature Engelmann spruce, and an endemic population of the spruce bark beetles. A history of fire suppression and marginal forest land management has defined the local forest composition and vulnerability.

The climate of Hinsdale County is such that it attracts those who are interested in some type of outdoor recreation and those people who want to build seasonal homes. Some want those for ski and snowmobile seasons, some for hunting or fishing and others who enjoy the cooler temperatures in the summer. The average annual maximum temperature in Hinsdale County is 55°F, with the highest temperatures of 76°F felt in the month of July. The average annual minimum temperature is 22°F and the coldest temperatures are felt in January with an average of -1.4°F. Refer to Section 4 Risk Assessment for more information on severe weather hazards.

The climate of the Planning Area varies from each year to year which effects the tourism season and the local economy. Drought and extreme monsoon years can lead to more hazardous events in the area which can cause a decline in the tourist and seasonal residents. Local businesses and the local economy rely on tourism during the peak seasons to maintain a steady income.

2.2 History

For several centuries prior to Euro-American settlement, the San Juan Mountains were inhabited by the Utes, the indigenous tribe that occupied the Rocky Mountain region for centuries before Anglo-European settlers arrived. The Utes were a loosely affiliated federation of seven nomadic bands, each claiming a different area of western Colorado and eastern Utah. The vicinity of present-day Lake City was visited by the Tabeguache (also called Uncompahgre) band of the Utes, who hunted and camped along the Gunnison River and its tributaries. Southern Hinsdale County was occupied by the Capote band that inhabited the southern San Luis Valley, the Rio Grande Valley, and Rio Grande headwaters. Some Ute trails were developed by settlers as roads. Wickiups, conical-shaped huts of propped poles covered with branches, are another remnant of these early peoples. Typically used as summer dwellings, a few wickiups have been documented at Cochetopa Pass midway between Lake City and Saguache near the former Los Pinos Agency.

In the early 1850s, two survey parties examined the Gunnison River 30 miles north of Lake City to evaluate its potential as a segment of the proposed trans-continental railroad. Captain John W. Gunnison in 1853 followed the Santa Fe Trail west and crossed La Veta Pass into the San Luis Valley. Traveling northward, the team of 30 scientists and 30 military escorts crossed Cochetopa Pass about 50 miles northeast of Lake City to reach the Gunnison River and followed it west to the Colorado River. The survey party continued west into Utah, where Paiutes killed Gunnison and seven of his men. In 1854, Fremont led a privately

funded expedition that followed the Arkansas River west and crossed into the San Luis Valley via the Sangre de Cristo Pass then over Cochetopa Pass to the Gunnison River ¹.

In the winter of 1873-1874 the infamous prospect party led by Alferd Packer entered the San Juan region. Led by Packer, the party of 21 prospectors departed from Bingham Canyon, Utah on November 8, 1873 in hopes of being among the first to locate mining claims in the San Juan region. With their food and supplies exhausted they reached the Ute encampment near present-day Montrose on January 21, 1874. Once at the encampment the party of 21 prospectors split into three factions. Chief Ouray warned the men about the treacherous winter conditions ahead of them. Some men paid a trespassing fee to Chief Ouray and camped with the Utes for the rest of the winter; others accepted a week's worth of provisions from Ouray and traveled on to the Los Pinos Agency in Saguache County; this group nearly perished after losing its way in the harsh mountain wilderness. A third group ignored Ouray's warnings; five prospectors outfitted with a week's worth of provisions followed Packer on February 9 southeast then south along the Lake Fork past the site that would become the site of Lake City within six months. Nothing was heard from the six prospectors for nearly three months until Packer arrived alone on April 16 at the Los Pinos Agency. He proceeded on to Saguache, where he attracted suspicion by spending large sums of money and having in his possession a rifle that had belonged to one of the missing men. Packer was arrested and jailed at Saguache and issued a confession to the crime.

In August of that year, a prospecting party discovered the bodies of the five missing men. An illustrator from Harpers Weekly accompanied the group and recorded the scene in visual graphic detail that riveted national attention of the grisly crime. Packer escaped the jail in Saguache and remained a free man for nine years. He was finally apprehended in Wyoming in 1883 and brought back to Hinsdale County where he was tried, found guilty of murder, and sentenced to hang. Packer appealed for a re-trial on the grounds that the crime was committed on the Ute Reservation in early 1874 and should therefore be subject to federal rather than local jurisdiction.

He was incarcerated at Gunnison where he awaited retrial for nearly four years, in the meantime becoming a local celebrity. Packer's retrial in 1886 found him guilty of five counts of manslaughter and he was sentenced to forty years of hard labor at the state penitentiary in Cañon City. In the early 1900s, news reporter Polly Pry launched a journalistic campaign to release Packer, and Denver Post publishers Fred Bonfils and Harry Tammen hired a lawyer to defend him. Packer received parole in 1905 and died two years later at a ranch near Deer Creek in western Jefferson County.

Packer's case reflects the eagerness of prospectors to trespass into the Ute reservation and illustrates how swiftly development took place once the San Juan region opened. The incident is also significant as the only known trial in the United States associated with human cannibalism, attracting national and international attention to Lake City and its environs. Although modern myth states that Packer was convicted of cannibalism, this is totally incorrect. Packer was tried and found guilty of murder in the first trial, and of manslaughter in the second trial. Further forensic studies have shown that Packer may have acted in self-defense.

Lake City was platted in fall 1874 during construction of the Saguache & San Juan Wagon Toll Road from Saguache to Baker's Park (Silverton). Road builders Enos T. Hotchkiss and J. D. Bartholf had already

¹ <http://www.lakecityhistoricdistrict.com/historic-context.html>



erected two log huts at the confluence of the Lake Fork River and Henson Creek. Town developers chose this location for the town site because of its flat terrain, abundant water, and proximity to the new Saguache & San Juan wagon road, a major route into the San Juan region. Hinsdale County became a Colorado County on February 10, 1874.

The Lake City Town Company incorporated in July 1875 to promote and sell town lots. The company had 22 directors including president Henry Finley, treasurer F. Newton Bogue, and trustees Isaac Gotthelf, Enos Hotchkiss, Otto Mears, William T. Ring, and Harry M. Woods. Envisioning the town as the "Metropolis of San Juan," these investors purchased hundreds of lots expecting land values to escalate once mining, transportation, and commerce boomed. The broad valley provided a park-like setting maximized by the optimistic town developers. They laid out a 260-acre town site that occupied the entire valley floor - 72 blocks of 32 uniform city lots, 25' x 125' in size².

During the first three years, Lake City progressed rapidly from settlement to town. At first, most buildings consisted of crude, one-room log cabins with dirt roofs. Tents sheltered many residents and a few businesses. Larger log buildings functioned as businesses, boarding houses, and residences. Lake City soon achieved a more permanent appearance. "Log cabins are giving way to commodious frame buildings," announced the Lake City Silver World on September 11, 1875. The town had 400 inhabitants with 67 buildings, several dozen more under construction, and "a new store opened every day." To meet the demand for building materials, four sawmills, a planing mill, a shingle mill, and a sash and door company were operating by 1876.

Availability of lumber products fueled the building boom and also encouraged improvements to existing buildings. Property owners covered log buildings in clapboards, expanded with frame additions, and expanded log business buildings with false fronts. Many early log huts were torn down or relegated to storage sheds. The boom attracted statewide attention and produced a number of the extant buildings in the Lake City Historic District (42 of the properties within the district were built between 1874 and 1878). Initial construction took place in somewhat random fashion, sometimes with little regard for lot lines or platted streets. Town trustees remedied the helter skelter layout by passing ordinances around 1877 requiring that buildings infringing upon the street or sidewalk right of way be moved behind the legal property line. The settlement took on the appearance of a town as streets were widened, trees planted, and ditches dug to provide water for trees and lawns and to fight fire³.

2.3 Population

Hinsdale County has been decreasing in population since 2010. The estimated 2010 county population was 843 people and decreased by 7%, estimated to be 791 in 2017. The Town of Lake City is the County's principal population center, comprising 32% of the total County population. According to the HMPC the population tends to fluctuate depending on the time of year. Based on vacancy rates and second homes the seasonal population is estimated to swell with approximately 2,500 part-time residents. Population trends for the Town of Lake City and the unincorporated county between 2010 and 2017 are provided in Table 2-1.

² <http://www.lakecityhistoricdistrict.com/settlement-1.html>

³ Houston, Grant E. Lake City Reflections. Gunnison, CO, B&B Printers, 1999, first edition 1976, 42.



Table 2-1 Hinsdale County Population Estimates 2010-2017

Jurisdiction	2010	2011	2012	2013	2014	2015	2016	2017
Town of Lake City	408	397	384	385	367	363	374	377
Unincorporated Areas	435	427	417	419	404	401	412	414
Total Hinsdale County	843	824	801	804	771	764	786	791

Source: Colorado Department of Local Affairs, Division of Local Government

The Colorado State Demography Office is forecasting the County's population to slightly increase between 2020 and 2040; reaching 825 by 2020 and 1,088 by 2040. The increase is due in part to the population aging and changes in the number of individuals in childbearing ages. Refer to Section 4 Risk Assessment for additional information on County development and population trends.

Select 2017 American Community Survey demographic and social characteristics for Hinsdale County are shown in Table 2-2.

Table 2-2 Hinsdale County Demographic and Social Characteristics

Characteristic	Hinsdale County	Town of Lake City
Gender/Age		
Male	46.8%	44.0%
Female	53.2%	56.0%
Under 5 years	3.5%	6.9%
65 years and over	26.7%	23.7%
Median Age (years)	57.2	52.6
Race/Ethnicity (one race)		
White	90.9%	87.1%
American Indian/Alaska Native	1.6%	1.9%
Hispanic or Latino (of any race)	6.0%	7.9%
Education		
High school graduate (includes equivalency), population 25 to 64 years	92.8%	93.6%

Source: U.S. Census Bureau, American Community Survey, 2017 <http://factfinder.census.gov/>

2.4 Government

2.4.1 Hinsdale County Government

Hinsdale County is governed by a Board of County Commissioners. The three Commissioners are elected for terms of 4 years. After the four-year term, the commissioner must run for the position and be elected by the voting population of Hinsdale County. The Board of County Commissioners is responsible for policy making, passing ordinances, resolutions, and is to manage the affairs of the county as authorized by the state. Powers granted to the board by the state are broad, which allow the board independence in judgment. Some examples of the board's powers are to:

- Acquire land for the construction, maintenance and repair of airports and fix and collect fees for their use
- Adopt ordinances as provided in the Colorado Revised Statutes
- Appoint staff and determine operating budget
- Build and maintain county buildings
- Construct or repair public roads, bridges and drainage facilities
- Contract with the Colorado Department of Corrections for placement of inmates in county jail
- Establish policies and procedures for the administration of county government
- Grant licenses as prescribed by law
- Levy taxes as provided by law; certify mill levies annually
- Organize or contract for ambulance service
- Organize the boundaries of precincts and establish voting places in each precinct
- Oversee county income and expenses; adopt annual budget
- Provide programs for aged and low-income residents

2.4.2 Town of Lake City Government

The Town of Lake City is a Statutory Town that is the county seat of, and the only incorporated municipality in Hinsdale County. Consisting of a Mayor, Town Clerk & Manager, support staff, and 6 trustees the Town of Lake City protects, maintains and enhances the sense of community, historical heritage and mountain environment. Through ethical and professional leadership the Town provides economic, recreational and social opportunities.

2.5 Economy

The unique landscape and outdoor recreation opportunities provide a strong tourism base in Hinsdale County, drawing tourists from the neighboring states of Texas and Oklahoma. According to the HMPC trends documented in the last six to eight years indicate an increasing number of visitors and tourists from Colorado as the statewide tourism base and economy grows. Accordingly, the industries that employ the most people in Hinsdale County are educational services, health care, and social assistance (17%), construction (16%), arts, entertainment, recreation, accommodation, and food services (14%), and retail trade (14%). The 2017 median household income in Hinsdale County was \$53,056 with 12.0% of people living below the poverty line.

The location of the County provides a remote and unobtrusive setting in a wilderness area in which people can often be far from a population center. The remoteness and inaccessibility that draws tourists can become a major problem in emergency planning and search and rescue. The area's steepness and remoteness also present a major problem in communication. Cell-phone service and internet service is often hard to receive in the County along with other forms of communication which can make mitigation and response efforts a difficult task.

While the location of the Planning area provides a unique economy, it also provides unique standards in planning for a hazardous event. The high-elevation mountain location of the County makes hazard mitigation planning atypical of other planning areas. As discussed in detail in Chapter 4 the County is susceptible to numerous natural and human-caused hazards.



2.6 Capability Assessment

This section presents Hinsdale County's mitigation capabilities, as well as the capabilities of the Town of Lake City that are applicable to the planning area. This assessment describes existing capabilities, programs, and policies currently in use to reduce hazard impacts or capabilities that could be used to implement hazard mitigation activities. It addresses regulatory mitigation capabilities and administrative/technical mitigation capabilities for the participating jurisdictions.

2.6.1 Planning and Regulatory Mitigation Capabilities

Table 2-3 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Hinsdale County and the Town of Lake City. Excerpts from applicable policies, regulations, plans, and programs descriptions follow to provide more detail on existing mitigation capabilities.

Table 2-3 Hinsdale County and Town of Lake City Planning and Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Hinsdale County	Town of Lake City	Comments
Building Codes	Yes	Yes	The County is looking into adopting the 2015 IBC. (Lake City) 2012 IBC
BCEGS Rating	No	No	
Capital Improvements Program (CIP) or Plan	No	Yes	Town of Lake City Capital Improvements Plan, May 2013
Community Rating System (CRS)	No	No	
Community Wildfire Protection Plan (CWPP)	Yes	No	2011 Update, Information related to Lake City is found within the County's CWPP
Comprehensive, Master, or General Plan	Yes	Yes	Lake City and Hinsdale County Community Plan (Revised Sept. 2018)
Economic Development Plan	Yes	Yes	2018 Updated "Bottom-up Plan"
Elevation Certificates	Yes	Yes	
Erosion/Sediment Control Program	No	No	
Floodplain Management Plan	Yes	No	
Flood Insurance study	Yes	Yes	1987
Growth management Ordinance	No	No	
Hazard-Specific Ordinance or Plan (Floodplain, Steep Slope, Wildfire)	Yes	No	(County) 8.9-11.A. General Standards – "Land subject to hazardous conditions such as land slides, mud flows, rock falls, snow avalanches, possible mine subsidence, shallow water table, open quarries, floods and polluted or nonpotable water supply shall be identified and shall not be subdivided until the



Regulatory Tool (ordinances, codes, plans)	Hinsdale County	Town of Lake City	Comments
			hazards have been eliminated or will be eliminated by the subdivision and construction plans"
NFIP	Yes	Yes	Entered 1987 (both communities)
Site Plan Review Requirements	Yes	Yes	8.9.7 (Hinsdale County)
Stormwater Program, Plan, or Ordinance	No	No	
Zoning Ordinance	Yes	Yes	
Other			County Alert and Warning Guide (May 2019)

As indicated in the table above, Hinsdale County and the Town of Lake City have several plans and programs that guide the planning area's mitigation of development in hazard-prone areas. Some of these plans and programs are described in more detail below.

Local Emergency Operations Plan (LEOP)

This plan describes the emergency management process to be utilized by the county and the town. This plan is also a general guidelines and principles for managing and coordinating the overall response and recovery activities during periods of emergency/disaster resulting from a natural or human-caused Multi-Hazard. As of 2019 this plan is undergoing a comprehensive update.

Hinsdale County Evacuation and Re-Entry Plan, 2019

This evacuation and re-entry plan is an annex to the County's Emergency Operations Plan and describes provisions being made to ensure the safe and orderly evacuation of people threatened by hazards the jurisdiction might face. Evacuation of the entire county is quite unlikely to the point it is difficult to generate probable scenarios leading to such an event. As such, this annex provides considerations for the evacuation of the Town of Lake City, local sub- developments, campgrounds and other areas where populations exist. County Emergency Management is the lead agency and then supported by the following agencies: Hinsdale County Sheriff's Office, Hinsdale County Public Health, Hinsdale County EMS, Hinsdale County Road and Bridge, Hinsdale County Search and Rescue, Colorado State Patrol, Colorado Department of Transportation, State Forest Service, State Parks and Wildlife, Rio Grande County, Mineral County, Archuleta County.

Tactical Interoperability Communication Plan (TIC)

The Tactical Interoperability Communications Plan (TIC) is the local communications plan for the Colorado Homeland Security/Emergency Management West Regions. The TIC plan is intended to document the interoperable communications resources available within the designated area, who controls each resource, and what rules of use or operational procedures exist for the activation and deactivation of each resource.

Flash Flood Protocol and Procedure Plan

The Flash Flood Protocol and Procedure Plan is for Hinsdale, Mineral, and Rio Grande Counties. The purpose of the plan is to develop a multi-jurisdictional, coordinated procedure for monitoring potential flash flood conditions, early notification of residents, and the assessment of critical infrastructure during



and following a flash flood event. The plan is intended to provide guidance to the county emergency managers and the county sheriffs of Hinsdale, Mineral, and Rio Grande to be consistent, methodical, and coordinated in the handling of emergency flash floods events. The plan will also assist policy makers in the decision making processes regarding the early notification and evacuation of impacted residents and guests, as well as to facilitate cooperation between counties to assist in rapid notification to the public in areas that, by virtue of unrealistic travel time associated with geography, are more rapidly reached by adjacent county responders under the direction of the adjacent sheriff.

Annual Operations Plan (AOP)

The Annual Operating Plan is prepared pursuant to the Colorado Statewide Wildland Fire Management Annual Operating Plan (Statewide Agreement) and the Agreement for Cooperative Wildfire Protection (State to County Agreement). The purpose of the AOP is to set forth standard operating procedures and responsibilities to implement cooperative wildfire protection on all lands within Hinsdale County. Participants of the AOP include the Hinsdale County Sheriff, Hinsdale Board of County Commissioners, Division of Fire Prevention and Control (DFPC), U.S. Forest Service (USFS), and Bureau of Land Management (BLM). All participants of the AOP agree to coordinate their wildfire protection activities as outlined in the plan.

Hinsdale County and Town of Lake City Community Plan, Updated 2018

The Lake City/ Hinsdale County Community Plan – Framing the Future is the adopted document that will guide all future development in the town and county. The Plan was developed in a multistage process and provides the vision, goals, and actions necessary to direct the town and county's growth. It is an official public document that should serve as the guide for decisions relating to the physical, social, and economic growth of the community. In addition to providing goals and objectives, the Plan assesses the opportunities and challenges facing the Town and County and sets priorities for an implementation program that outlines specific actions and practical results. It is important that the needs and aspirations identified in the Plan be balanced with the primary roles and duties of the Town in providing mandatory and essential municipal services, and the County in providing more limited, rural services.

The Community Plan is a principle part of the overall, on-going planning process. Approval of the Community Plan by the Town Trustees and Board of County Commissioners establishes the vision and direction of the community and represents an important first step toward achieving the stated goals. This Plan should not be considered a static document. It is the result of a continuous process to gather and evaluate information and make informed decisions based upon constantly changing conditions. The Plan should be reviewed regularly, revised, and updated as needed to maintain its applicability to current conditions and established priorities. At a minimum, the entire plan should be revisited every five years to ensure that it continues to reflect the true values and direction of the changing community.

While Lake City/ Hinsdale County's Community Plan should be flexible enough to respond to changing needs, the community must remain steadfast in its vision and support for the core goals and objectives contained in the Plan. Lake City/ Hinsdale County's Community Plan is a guide with a foundation in state law. Since Lake City is a municipality, it is permitted to plan streets three miles beyond its borders and to prepare land use plans for areas that have direct relationships to street planning.



Hinsdale County Community Wildfire Protection Plan, 2011 (revised)

The Hinsdale County CWPP outlines the risk associated with the Wild Urban Interface (WUI) land, and defines the community's priorities for protection of life, property, and critical infrastructure in the hazard-prone areas. The Hinsdale County land included in this planning area is primarily owned by the US Forest Service, with some areas owned privately. The Piedra/Palisades WUI is located within the boundaries of this planning area and includes 155 structures in a high-risk area. This document is useful for identifying specific action items that relate to fire hazard in the planning area and can supplement any projects described later in Section 5 Mitigation Strategy.

Continuity of Operations Plan (COOP)

The COOP outlines circumstances under which the plan should be executed, provide guidance on the key elements of plan, and reflect the organization's implementation strategies. The COOP annex will be executed during all hazards events that have made it necessary to utilize alternative methods of maintaining the agency functions. This may include an internal disaster, such as a fire in the building that the agency is located. It could include an event, such as a tornado or flood where accessing services at the agency may be interrupted due to debris or impassable roads. Executing the plan may also occur due to a large disease outbreak, or mass fatality event, where components of the agency mission (vital records) may be overwhelmed. Implementing this annex may also become necessary with the loss of essential leaders in the agency or required evacuation of the population that the agency serves.

Town of Lake City Capital Improvements Plan, 2013

The Town of Lake City Capital Improvement Plan (CIP) explains the existing conditions as well as identified deficiencies in the Town's infrastructure and builds off of previous capital facilities planning. The plan includes project costs and phasing as well as a budgetary analysis that explains the current funding capacity and possible funding alternatives. The Town of Lake City CIP is organized into the following three parts each describing different components of the infrastructure needs: Part 1 – Downtown Core Infrastructure Implementation Plan, Part 2 – General Government Facilities and Streets Capital Improvement Plan and Part 3 – Recreation Capital Improvement Planning.

Land Use Regulations

Hinsdale County and the Town of Lake City have adopted land use regulations with the purpose of promoting the health, safety, and general welfare of the present and future inhabitants in both communities. The regulations guide planning for and regulating the use of land so as to provide planned and orderly development and environmental protection in a manner consistent with constitutional rights.

The Hinsdale County Land Use Regulations were originally adopted in 1979 and have been amended several times since its original adoption, most recently in April 2011. The Town of Lake City first adopted their land use regulations in 1969 and have amended them in 2017. Both codes give special attention to hazardous areas, with the intent of protecting lands from activities that would cause immediate or foreseeable material danger to significant wildlife habitats, to regulate the use of land on the basis of impact on the communities or surrounding areas, and to secure safety from fire and other damages, among other things.



Public Health Emergency Operations Plan (PHEOP)

The Public Health Emergency Operations Plan (PHEOP) has been developed for use by the Hinsdale County Public Health Agency. The PHEOP was established to promote a system to: save lives; protect public health and the environment; alleviate damage and hardship; and, to reduce future vulnerability within Hinsdale County. Further, this document indicates the commitment to annual planning, training, and exercise activities in order to ensure the level of preparedness necessary to respond to emergencies or disasters within the County.

Point of Dispensing (POD)

The purpose of this plan is to provide operational guidance for the Hinsdale County Public Health Agency (HCPHA) in order to vaccinate the projected base population of Hinsdale's 842 residents (as of the 2010 census) treatment within 1-2 days and Hinsdale's projected surge population of 3000-5000 /treated within 3-5 days. This plan will be used during a public health emergency and was created to assist local, regional and state personnel in initiating requests for supplies and implementing rapid distribution measures to protect the general public by the following:

- Reducing mortality and morbidity
- Preserving healthcare services infrastructure
- Minimizing social disruption during a natural or intended disaster

Local Avalanche Report

The Local Avalanche Report was put together by Eric Larson in 2007. The study assessed avalanche hazard zones of Hinsdale County and Lake City. Each assessment describes a specific area and identifies specific avalanche hazards. The report discusses mitigation actions and each assessment concludes with recommendations with public safety in mind. These local reports along with state and federal reports provide information on where hazards are likely to occur and could lead to the development of ordinances that will guide people where and where not to build.

Floodplain Management Regulations and NFIP Participation

Section 5.17 of the Hinsdale County Land Use Regulations detail the floodplain management regulations for the County. The County originally adopted floodplain regulations in the 1987 Resolution No. 11. Chapter 10, (Ord. No. 2015-13) of the Town of Lake City Land Use Regulations contain the floodplain regulations for the Town. The purpose of these regulations is to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas. These regulations apply to all areas of special flood hazards within the jurisdiction of Hinsdale County identified in FEMA's September 30, 1987, flood insurance rate maps (FIRM).

Both Hinsdale County and the Town of Lake City participate in the National Flood Insurance Program (NFIP). Both communities joined the NFIP on September 30, 1987, by administering floodplain management regulations that meet the minimum requirements of the NFIP. Where base flood elevation (BFE) data is available, both communities require the first finished floor elevation must be 1 foot above the BFE. The County maintains a file of elevation certificates for unincorporated areas and the town. The County provides floodplain management capabilities for Lake City. More details on NFIP policies and claims in Hinsdale County and the Town of Lake City are included in Section 4 Risk Assessment.



2.6.2 Administrative and Technical Mitigation Capabilities

Table 2-4 identifies the County and Town personnel responsible for activities related to mitigation and loss prevention in Hinsdale County and the Town of Lake City.

Table 2-4 Hinsdale County and Town of Lake City Administrative/Technical Mitigation Capabilities

Personnel Resources	Hinsdale County	Town of Lake City	Comments
Emergency Manager	Yes	Yes	Position being filled in 2019; Town Manager (Lake City)
Floodplain Administrator	Yes	Yes	Building Official (County) provides administration for both the County and the Town of Lake City
Community Planning	Yes	Yes	Both communities have a Planning Commission and Board of Adjustments
Planner/Engineer (Land Development)	Yes	Yes	County Planning Commission; Town Planning Commission
Planner/Engineer/Scientist (Natural Hazards)	No	No	
Engineer/Professional (Construction)	Yes	Yes	County Building Official
Resiliency Planner	No	No	Partnership with Colorado Resiliency Office to further develop Recovery and Resiliency Plans (2019)
Transportation Planner	No	No	
Full-Time Building Official	Yes	Yes	Shared position
GIS Specialist and Capability	Yes	Yes	County is implementing GIS capabilities in a 2019/2020 grant.
Grant manager, Writer, or Specialist	Yes	Yes	These functions are handles within out administration offices of Hinsdale County/Town of Lake City
Warning Systems/Services			
- General	Yes	Yes	CodeRED; IPAWS
- Flood	Yes	Yes	Building Official
- Wildfire	No	No	The County partners with three outside organizations for wildfire mitigation.
- Severe Weather	Yes	Yes	Siren being installed in 2019
- Geological Hazards	No	No	Colorado Geological Survey has offered assistance in 2019 with avalanche and debris flow events.

The following departments are involved in hazard mitigation in Hinsdale County and the Town of Lake City:



Emergency Medical Services Director

The EMS Director leads a group of dedicated volunteers to assist residents and visitors in case of a medical emergency. Hinsdale County EMS is a volunteer-based organization that provides emergency medical care to citizens of Lake City & Hinsdale County as well as visitors to the area. The mission statement for emergency services is to develop and maintain procedures for the handling of mass casualties within the parameters of the identified hazard threats. In coordination with the Lake City Area Medical Center(LCAMC) and Gunnison Valley Hospital Administrator, keep the Hinsdale County Health Nurse abreast of the current and projected status of medical resources within the county based on the potential, or actual, developing emergency/disaster situation. Be prepared to receive, organize and utilize, augmentation land and/or air medical resources should the need arise.

Office of Emergency Management

The County Office of Emergency Management (OEM) coordinates planning and preparedness, response and recovery efforts for disasters occurring within the unincorporated area of Hinsdale County and assists the Town Manager, the designated Town Emergency Manager for Lake City with these efforts within the Town. The Office of Emergency Management has the mission of serving the public before, during and after disasters. OEM communicates and coordinates with all levels of government and many other entities in order to minimize the impact of disasters and enable affected communities to return to pre-disaster conditions as soon as possible. The Office of Emergency Management is responsible for public outreach related to hazards, including educating the public on preparedness and mitigation actions. The department is also responsible for the public alert and notification systems to notify the public during an emergency.

Planning Commission

Hinsdale County and the Town of Lake City each have Planning Commissions, an advisory board with the role of reviewing development applications in accordance with the Land Use Regulations and Community Plan. Planning Commissions are governed by the general objectives of guiding and accomplishing a coordinated, adjusted and harmonious development of Hinsdale County and the Town of Lake City. Consideration is also given to efficiency and economy in traffic, the promotion of safety from fire and other hazards, adequate provision for light and air, the promotion of healthful and convenient distribution of population, the promotion of good design and arrangement, wise and efficient expenditure of public funds, and the adequate provision for public utilities and other public requirements.

Hinsdale County Sheriff's Department

The County Sheriff's office is composed of a Sheriff, an undersheriff, an office manager, three deputies and a reserve deputy. Other members of the sheriff's department include 5 non-certified deputies. "Sworn Non-Certified" Deputies are volunteers, similar to "Reserve" Deputies but they have not graduated from a post certified police academy, or, if they have, are no longer current. As such they have no law enforcement authority except for two areas. One, they can enforce County and Lake City Town Ordinances. Two, in the event of an emergency, law enforcement authority can be temporarily bestowed by the Sheriff until such emergency has concluded. Beyond that they perform such non-enforcement tasks as assigned by the Sheriff. That can include security at various public events such as the annual local Wine & Music Festival, the various 4th of July events, traffic control, security at crime scenes/search & rescue events/wildland fires/evacuations/making notifications (death, evacs, etc.)/court trials/Sheriff's



Office facilities/executive appearances. Sworn Non-Certified Deputies also attend and participate in firearms and tactical training with the sworn staff, at least once a year. Sworn Non-Certified Deputies are an extremely valuable asset to the Hinsdale County Sheriff's Office, especially considering this Agency's limited financial resources. The mission statement of the Sheriff's department is to ensure a safe and secure environment for all persons in Hinsdale County by providing professional law enforcement through responsive, caring, and dedicated service.

Hinsdale County Road & Bridge Department

The Road and Bridge Department is responsible for the repair and maintenance of County roads within the Planning Area. Hinsdale County Road and Bridge Department maintains 252 miles of roads. The Department also maintains 100 plus miles of snowmobile trails from December 1- April 1 of each year. 10 bridges are maintained by the Road and Bridge Department. The Road and Bridge Department does all the hauling and maintenance at the Hinsdale County Transfer Station. The average 12-month load haul count is 110 40-yard loads of household garbage, waste building materials, old appliances, recycled cardboard, recycled glass, recycled aluminum, along with 2000 gallons of cooking oil and another 3000 gallons of used engine oil to be recycled. Most of the Transfer Station loads are hauled to Gunnison for recycle or the Gunnison County Landfill for disposal.

Building & Enforcement Department/Floodplain Administrator

Development services include the Building and Planning departments and are responsible for planning and implementation of zoning, building, and land use regulations. The purpose of the Hinsdale County and the Town of Lake City Land Use Codes are to promote the health, safety, and general welfare of the present and future inhabitants of Hinsdale County by planning for and regulating the use of land so as to provide planned and orderly development and environmental protection in a manner consistent with constitutional rights. The intent of the code is to regulate development and activities in Hinsdale County, to give special attention to hazardous areas, to protect lands from activities that would cause immediate or foreseeable material danger to significant wildlife habitats, to regulate the use of land on the basis of impact on the communities or surrounding areas, and to secure safety from fire and other damages, among other things. The Hinsdale County Floodplain administrator provide information on the community's flood hazard maps, floodplain ordinance, repetitive loss properties, and actions to continue compliance with the National Flood Insurance Program and reduce flood losses.

2.6.3 Financial Mitigation Capabilities

Table 2-5 identifies the financial capabilities that can be used in the implementation of mitigation and loss prevention activities in Hinsdale County and the Town of Lake City.

Table 2-5 Hinsdale County and Town of Lake City Financial Capabilities

Financial Resources	Hinsdale County	Town of Lake City	Comments
Has the community used any of the following to fund mitigation?			
Levy for Specific Purposes with Voter Approval	Yes	Yes	
Utilities Fees	No	Yes	
System Development/Impact Development Fees	Yes	Yes/No	
General Obligation Bonds to Incur Debt	Yes	No	
Special Tax Bonds to Incur Debt	No	No	(Lake City) Drainage District
Withheld Spending in Hazard-Prone areas	No	No	
Stormwater Service Fees	No	No	
Capital Improvement Project Funding	Yes	Yes	
Community Development Block Grants	Yes	No	
Other		Yes	(Lake City) DAC funds for water and sewer projects

2.6.4 Public Education and Outreach Mitigation Capabilities

Table 2.4 identifies the County personnel responsible for activities related to mitigation and loss prevention in Hinsdale County and the Town of Lake City.



Table 2-6 Hinsdale County and Town of Lake City Public Education and Outreach Capabilities

Education & Outreach	Hinsdale County	Town of Lake City	Comments
Local citizen groups that communicate hazard risks	Yes	Yes	
Firewise	No	No	The County does partner with three organizations for wildfire mitigation. Middle of County: RWEACT (Rio Grande Watershed Emergency Action Coordination Team) and there are currently efforts to create a SLV council; Pagosa Area of Hinsdale: Fire Adapted Communities; Northern part of County: West Region Wildfire Council
StormReady	No	No	
Other			

Hinsdale County and the Town of Lake City have several outreach and public education activities in an effort toward informing the public on hazards and hazards mitigation. The following is an overview of efforts put forth in the County to educate the public:

Public Health issues are addressed during the annual health fair conducted at the Lake City area medical center. Hinsdale County Public Health department offers services for the more vulnerable members of the community including those under six years of age, those over sixty-five, and those with severe physical limitations. Public servants of the County are committed to increasing public awareness of existing hazards and mitigation capabilities through increased outreach programs and educational opportunities. In addition, opportunities for public involvement in mitigation efforts will be pursued.

Lake City Fire & Rescue, in conjunction with the Sheriff's Office & Emergency Management, have conducted fire wise community workshops in the past, and , most recently a county-wide "Ready, Set, Go!" mail-out. The Sheriff's office regulates all open fires in the county through burn permit issuance and burn bans. Fuels inspections, weather inspection, weather advisories, cooperation with the fire district, and public service announcements/ postings have proven to be very effective in wildfire prevention.

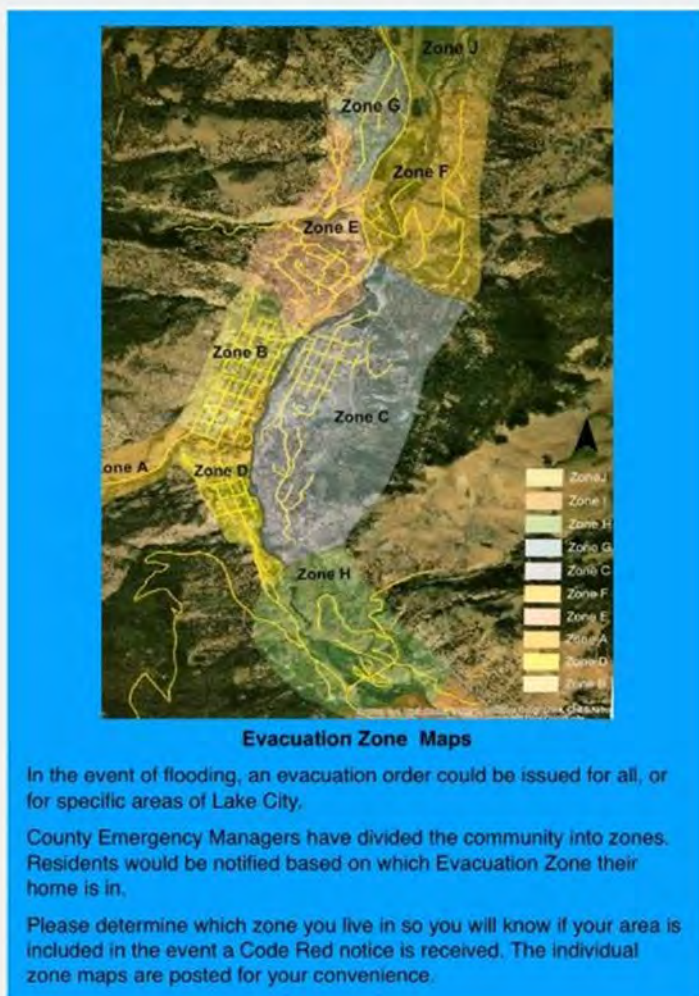
Lake City Schools and the Sheriff's office conduct an annual lock down exercise at the school in conjunction with other local emergency response personnel. This event incorporates evacuations plans, active shooter scenarios, coordinated emergency response, and secures communication capabilities. Flash flood and severe weather early warning programs are always in effect that include periodic reminders to local residents. These warning systems are regarding pre-evacuation plans for the specific hazards, evacuation, and or other actions as advised.

In July 2019, after an unprecedented avalanche season, the County and the Town of Lake prepared for potential flooding events. Using the Hinsdale County website, information evacuation and emergency alert and warning guides were posted to their website to help prepare citizens for a potential evacuation and understand what various alerts and warning definitions.

Figure 2-3 Town of Lake City Evacuation and Emergency Alert Information, July 2019

EVACUATION & ALERT INFORMATION

The following evacuation map has been created to identify areas in and around Lake City for potential evacuation. **THERE ARE NO EVACUATION ORDERS AT THIS TIME.**



Evacuation Plan

Alert & Warning Guide

Source: Hinsdale County website. Accessed on: July 11, 2019

2.6.5 Special Districts, Stakeholder Agencies, and Other Mitigation Partnerships

In addition to public education and outreach efforts that the County and Town have implemented, there are several special districts and stakeholder agencies that assist in the mitigation efforts. The following is a description of some of these stakeholders and districts.

Lake City Area Fire Protection District

Lake City fire and rescue is an all-volunteer department within the Town of Lake City's Area Fire Protection District.

Lake City Community School District

The Lake City Community School serves students from pre-school through 12th grade right in Lake City. Lake City's school consistently rates as one of the best public schools in Colorado. Hinsdale County School District RE-1 is governed by a five-member elected Board of Directors that works with the school Superintendent under a Modified Policy Governance system. The school is supported by the property taxes and generous contributions of the citizens of Hinsdale County. The District places particular focus on state standards, child-oriented individualized learning, a low student- teacher ratio and technology.

West Region Wildfire Council

The West Region Wildfire Council's (WRWC) mission is to promote, "...wildfire preparedness, prevention and mitigation education throughout Delta, Gunnison, Hinsdale, Montrose, Ouray and San Miguel counties. Our mission is to mitigate loss due to wildfire in wildland urban interface communities while fostering interagency regional partnerships to help prepare counties, fire protection districts, communities and agencies to plan for and mitigate potential threats from wildfire"(WRWC). Established in 2007, the WRWC holds a monthly regional forum that brings together wildland urban interface residents, fire districts and other partners to discuss wildfire related educational topics and to support interagency efforts to implement wildfire mitigation projects.

Lake Fork Health Service District

A group of far-sighted local citizens first met in 1974 to discuss the idea of opening a local medical clinic. The medical clinic first opened in June of 1975 in the front of the Women's Club Building on Silver Street in downtown Lake City. In 1990 a ground-breaking ceremony for a new medical facility was held and in 1991 medical operations were transferred to the new facility at 700 North Henson Street. The Lake City Area Medical Center began doing business under the Lake Fork Health Service District (a special taxing district) in 2002. The LFHSD was created with the goal of stabilizing comprehensive health care service for the residents and visitors of Hinsdale County. It strives to expand the services and quality of care delivered. The Board of LFHSD conceived of expanding the clinic at 700 Henson, and saw that goal through fund-raising, design, and construction. Moseley Health Care Complex: named in recognition of the vital role Jack and Kathy Moseley played to bring the facility to completion. The complex is comprised of the Medical Clinic, Emergency Medical Services offices, training/meeting rooms, and ambulance garage, plus the Zeller Wellness and Conference Center.

Silver Thread Public Health District

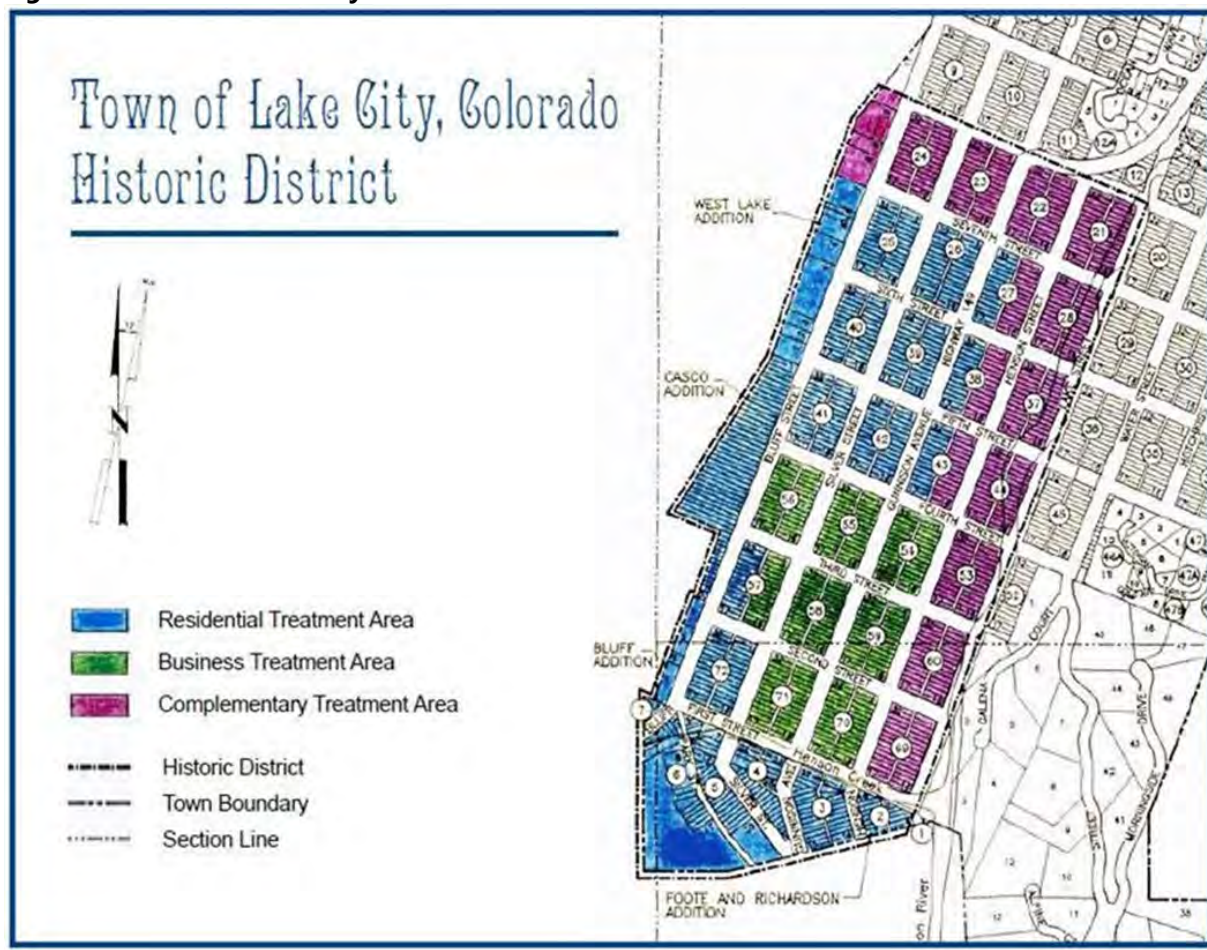
The Silver Thread Public Health District provides health information, programs, services, and resources to the residents and visitors to Hinsdale and Mineral counties. The District provides emergency information on their website for both counties including a link to the Hinsdale County Evacuation Plan and Alert and Warning Guide. According to the HMPC the Silver Thread Public Health District also has in place a PEOP and a Continuity of Operations Plans.



Lake City Historic District

There are over 240 properties within the Town of Lake City that represent these important times in American history. The Lake City National Historic District covers about 142 acres of land in more than 34 blocks and additions, making it one of the largest historic districts in Colorado. It is also one of the oldest, and best preserved, historic districts in the state. The Design Guidelines serve as a tool for preserving the Lake City Historic District; located within the Town of Lake City. These guidelines inform property owners and builders about compatible and appropriate design for new construction within the District. They provide design expectations for additions and alterations made to the District's historic buildings. They also advise property owners on preserving their historic commercial buildings and houses. The Design Guidelines are used by the Lake City Building Inspector, the Preservation Review Officer, and Board of Trustees as they review design plans for construction projects within the Historic District.

Figure 2-4 Town of Lake City Historic District



Source: Hinsdale County LHMP 2014

Colorado Division of Homeland Security and Emergency Management

After an unprecedented avalanche season in winter 2019, leading to massive amounts of debris to be pushed into the county's waterways, the State of Colorado Division of Homeland Security and Emergency Management assisted Hinsdale County and the Town of Lake City in flood mitigation and preparedness efforts. As snowmelt began in spring 2019, Hinsdale County and especially Lake City became increasingly

vulnerable to flooding and debris flow events. After receiving a request for technical assistance and financial resources from the County Administrator, the State Director of the Office of Emergency Management issued the "State Support Plan: Hinsdale County Flooding Mitigation and Preparedness" to assist the County in providing and coordinating efforts. This plan activated the State Emergency Operation Center which consisted of various state departments and agencies including:

- Department of Natural Resources
- Department of Transportation
- Department of Public Health and Environment
- Department of Local Affairs
- State Historic Preservation Office/History Colorado
- Colorado Tourism Office
- Colorado Office of Economic Development and International Trade
- Colorado Geological Survey
- U.S. Bureau of Land Management

2.6.6 Opportunities for Enhancement

The 2019 update provided the County an opportunity to review and update the capabilities currently in place to mitigate hazards. This also provided an opportunity to identify where capabilities could be improved or enhanced. Specific opportunities could include:

- Development and Implementation of a Capital Improvements Plan (Hinsdale County)
- Update of the Hinsdale County Continuity of Operations Plan
- Additional alert and warning planning
- Integrating various (3) County Evacuation plans
- Update the Hinsdale County and Town of Lake City Community Plan
- Hinsdale County Planning Commission taking natural hazards into consideration when reviewing development applications, avalanche issues in particular



SECTION 3 PLANNING PROCESS

DMA Requirements §201.6(b) and §201.6(c)(1):

An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

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

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

3.1 Background on Mitigation Planning in Hinsdale County

Hinsdale County originally developed this Hazard Mitigation Plan in 2003 and was one of the first counties in Colorado to have a plan prepared in compliance with the DMA 2000 requirements. The first update to the plan was completed in 2014, which was subsequently approved by FEMA and adopted by the County in May. The plan underwent a comprehensive update in 2019 to comply with the five-year update cycle required by the DMA 2000. The planning process and update of this plan was originally initiated in the spring of 2019 under the coordination of the Hinsdale County Administrator. Funding was secured through a FEMA Pre-Disaster Mitigation planning grant to enable a consultant to be hired to facilitate the process and develop the plan. Wood Environment and Infrastructure Solutions (Wood) of Denver, Colorado contracted with the County to provide professional planning services during the development of the original plan. The development of the plan followed a structured planning process that involved various local government departments and other public and private stakeholders. The planning process followed during the update was similar to that used in the original plan development. The process is described further in this section and documented in Appendix B.

3.1.1 What's New in the Plan Update

DMA Requirement §201.6(d)(3):

A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

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

This HMP update involved a comprehensive review and update of each section of the 2014 plan and includes an assessment of the progress in evaluating, monitoring and implementing the mitigation strategy outlined in the initial plan. The planning process provided an opportunity to review jurisdictional priorities related to hazard significance and mitigation action, and revisions were made where applicable

to the plan. Only the information and data still valid from the 2014 plan was carried forward as applicable into this LHMP update. New to the 2019 plan update was the addition of climate change considerations within each hazard profile in particular in areas where the frequency and intensity of hazards might change in the future, where applicable.

3.1.2 2014 Plan Section Review and Analysis

During the 2019 update process, the HMPC updated each section of the previously approved plan to include new information and improve the organization and formatting of the plan's contents. The HMPC and Wood analyzed each section using FEMA's local plan update guidance to ensure that the plan met the latest requirements. Upon review the HMPC and Wood determined that nearly every section of the plan would need some updates to align with the latest FEMA planning guidance and requirements. The overall format and structure of the plan changed to align the plan with modern hazard mitigation planning practices. The Risk Assessment in Section 4 was substantially revised to incorporate recent events and expand on information, including a GIS-based risk assessment. Information within has been updated throughout the plan where appropriate. The mitigation strategy in Section 5 has been updated to reflect current priorities and mitigation actions moving forward from the 2014 plan.

3.2 Local Government Participation

The Disaster Mitigation Act (DMA) planning regulations and guidance stress that each local government seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

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

For the Hinsdale County Multi-Hazard Mitigation Plan's HMPC, "participation" meant:

- Attending and participating in the HMPC meetings,
- Providing available data requested of the HMPC,
- Reviewing and providing comments on the plan drafts,
- Advertising, coordinating, and participating in the public input process, and
- Coordinating the formal adoption of the plan by the governing boards.

Hinsdale County's Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that geographically covers everything within Hinsdale County, shown in Section 2 Community Profile. Unincorporated Hinsdale County and the Town of Lake City participated in the planning process and are seeking FEMA approval of this plan. Both entities have the authority to regulate development.

3.3 The 10-Step Planning Process

Hinsdale County and Wood worked together to establish the planning process for Hinsdale County's plan update using the DMA planning requirements and FEMA's associated guidance. The original FEMA planning guidance is structured around a four-phase process:

1. Organize Resources



2. Assess Risks
3. Develop the Mitigation Plan
4. Implement the Plan and Monitor Progress

FEMA's March 2013 Local Mitigation Planning Handbook recommends a nine-step process within the original four phase process. Into this four-phase process, Wood integrated a more detailed 10-step planning process used for FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. Thus, the modified 10-step process used for this plan meets the funding eligibility requirements of the Hazard Mitigation Assistance grants (including Hazard Mitigation Grant Program, Pre-Disaster Mitigation program, Flood Mitigation Assistance), Community Rating System, and the flood control projects authorized by the U.S. Army Corps of Engineers (USACE). Table 3-1 summarizes the four-phase DMA process, the detailed CRS planning steps and work plan used to develop the plan and the nine handbook planning tasks from FEMA's 2013 Local Mitigation Planning Handbook. The sections that follow describe each planning step in more detail.

Table 3-1 Mitigation Planning Process Used to Update the Plan

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



3.3.1 Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

Wood worked with Hinsdale County Administration to establish the framework and organization for the update of this Plan. Wood and the County Administrator identified the key county, municipal, and other local government and initial stakeholder representatives. Invitations were emailed to invite them to participate as a member of the HMPC and to attend a kickoff meeting. Representatives from the following County and Town of Lake City departments and boards as well as special districts participated on the HMPC and the development of the plan:

Hinsdale County

- County Administration
- Sheriff
- Building
- Road and Bridge
- Board of County Commissioners
- Emergency Services

Town of Lake City

- Mayor
- Town Manager

A list of specific HMPC representatives is included in Appendix A. Other local, state, federal, and private stakeholders invited to participate in the HMPC are discussed under Planning Step 3.

During the plan update process, the HMPC communicated with a combination of face-to-face meetings, phone interviews, and email correspondence. Three planning meetings with the HMPC were held during the plan's development between April 2019 and August 2019. The meeting schedule and topics are listed in the following table. All meetings were held at the Coursey Annex in the Town of Lake City. The sign-in sheets and agendas for each of the meetings are included in Appendix B.

Table 3-2 Schedule of HMPC Meetings

HMPC Meeting	Meeting Topic	Meeting Date
1	Kickoff Meeting: Introduction to DMA Planning and overview of Update Process, Hazard Identification Review MACs Meeting	April 11, 2019
2	Risk Assessment Summary/Goals Development	July 12, 2019
3	Mitigation Strategy Development	August 13, 2019

During the kickoff meeting, Wood presented information on the scope and purpose of the plan, participation requirements of HMPC members, and the proposed project work plan and schedule. A plan for public involvement (Step 2) and coordination with other agencies and departments (Step 3) was discussed. Wood also revisited the hazard identification section of the plan with the HMPC members.



Planning Step 2: Involve the Public

At the kickoff meeting, the HMPC discussed options for soliciting public input on the mitigation plan and developed an outreach strategy by consensus. Public and stakeholder input was done through a combination of a public meeting and an on-line survey. During the plan update's drafting stage, the HMPC provided links to a public survey via Survey Monkey. The survey was advertised by the County through social media and posted to the County's website. The survey and public meeting were also advertised in the Lake City 'Silver World' which is an online version of the local newspaper.

Figure 3-1 Public Survey Announcement Posted on Hinsdale County Website

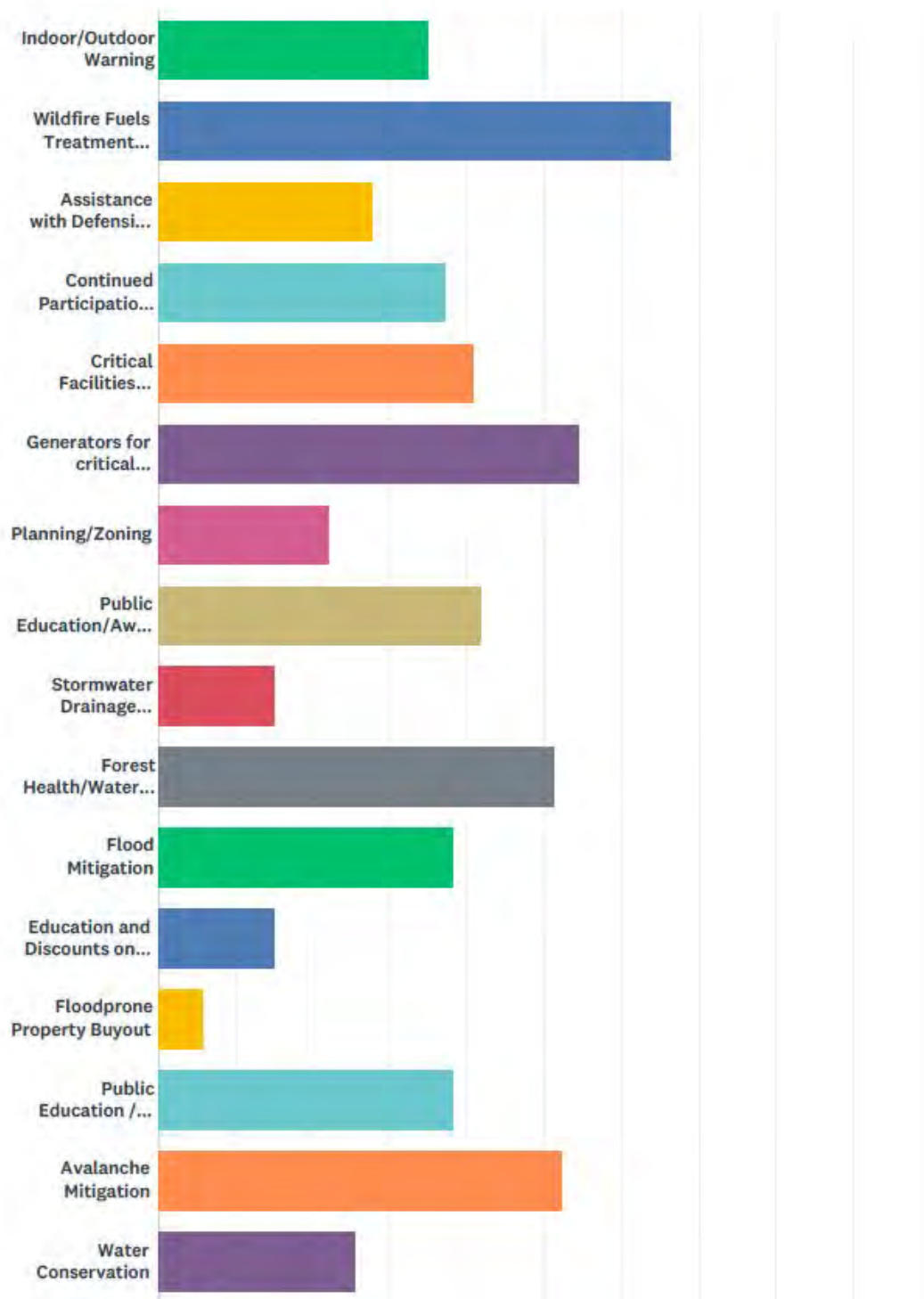


The survey provided an opportunity for public input during the planning process, prior to finalization of the plan update. The public survey received responses from 110 individuals and was considered a successful response representative of approximately 14% of the County's population. Responses reflect the public perception that the most significant hazards to be wildfire, followed closely by avalanche, severe winter storms, and power outages/utility failure.

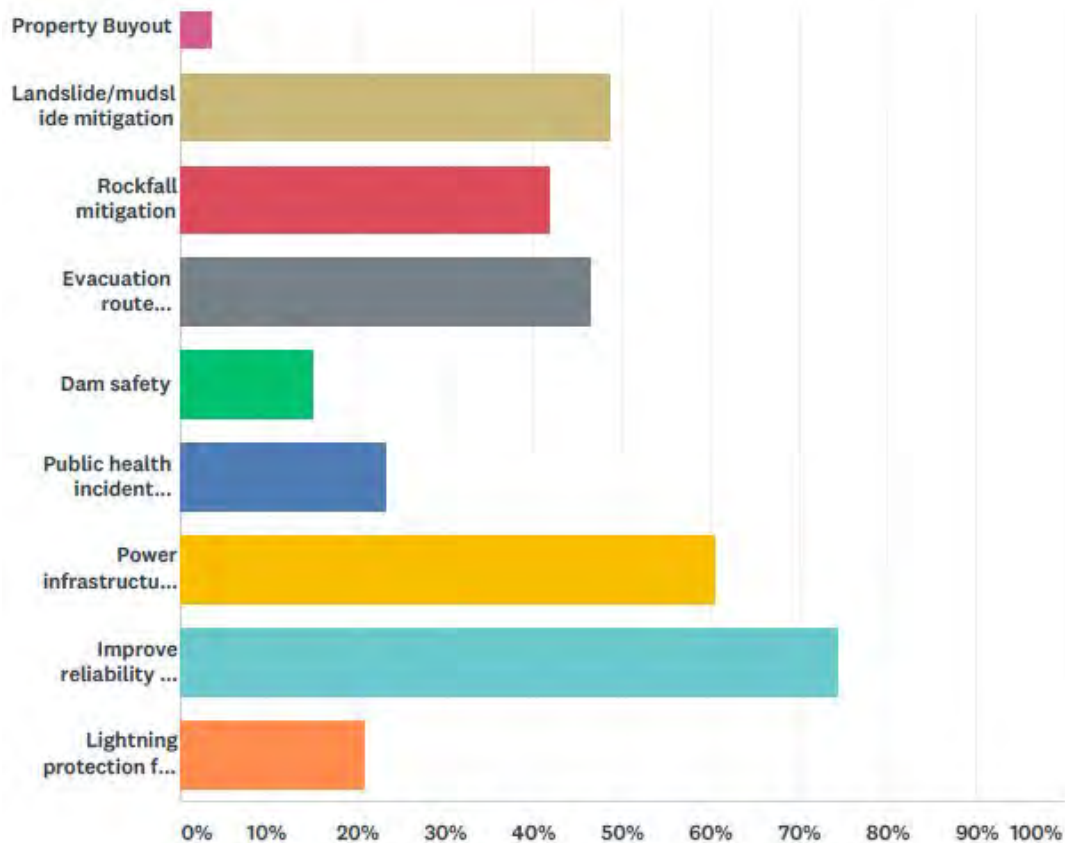
Figure 3-2 below displays the results from Question 3, which asked respondents to consider potential mitigation actions and to indicate which types of actions should have the highest priority in the updated County Mitigation Strategy. These results were considered during the planning process and in the development of new mitigation actions. As indicated by the survey excerpt below, the highest priority action items should include improvements to the reliability of communication systems (74%), wildfire treatment projects (66%), power infrastructure protection (60%), generators for critical facilities (55%) and avalanche mitigation (52%). Further results of the public survey are provided in Appendix B.

Figure 3-2 Hinsdale County Public Survey Results, Question 3¹

Answered: 86 Skipped: 24



¹ Question 3 states: Mitigation is actions that can be taken to reduce or eliminate the long-term risk to hazards. The following types of mitigation actions may be considered in Hinsdale County. Please indicate the types of mitigation actions that you think should have the highest priority in the Hinsdale County Hazard Mitigation Plan.



As part of the planning process, a public meeting was held on August 12, 2019 at the Coursey Annex in the Town of Lake City. Advertisements for the meeting were placed in the Lake City Silver World newspaper and website and the County's website. The ads encouraged residents to attend and learn about the hazards that could impact the County and how the plan could help reduce those impacts. Present at the meeting were two members of the public and one County Commissioner. One of the members of the public was also a member of the Lake City Historic Preservation Commission.

The public was given an opportunity to review and comment on the draft plan in November 2019. Hinsdale County made copies of the plan available on the County website and a hardcopy was placed in the local library and made available at the County Administration office. A public input comment form was available with the online plan. The plan was advertised by the County through their Facebook page. The public was given a two-week period to review and provide comments. The public review produced one set of comments left on the online comment form. The comments resulted in some minor adjustments to text in Section 2 to make the plan more accurate. Record of public advertisements, public input, and sign-in sheets can be found in Appendix B.

Planning Step 3: Coordinate with Other Departments and Agencies

There are numerous organizations whose goals and interests' interface with hazard mitigation in Hinsdale County. Coordination with these organizations and other community planning efforts is vital to the success of this plan's update and implementation. The HMPC determined that data collection, mitigation strategy development, and plan approval would be greatly enhanced by inviting state and federal agencies and power and communications organizations to participate in the process. An opportunity for

neighboring communities, local and regional agencies involved in hazard mitigation activities was provided either through invitation to meetings, phone and email communication during the process, or provided an opportunity to review and comment on the plan prior to finalization. The following agencies were reached out to during the planning process. Some were present at HMPC meetings (indicated by an Asterix) and/or supplied information to the HMPC that was used to inform the risk assessment. Neighboring jurisdictions were asked to comment on the plan prior to its finalization, but no comments were received.

- Colorado Avalanche Information Center
- Colorado Department of Transportation*
- Colorado Division of Homeland Security and Emergency Management*
- Colorado Division of Water Resources – Dam Safety
- Colorado Geological Survey (Colorado School of Mines)
- US Bureau of Land Management
- US Department of Agriculture
 - Gunnison National Forest
 - Grand Mesa National Forest
 - Uncompahgre National Forest

Special Districts

- Silver Thread Public Health District
- Lake City Community School/Hinsdale County School District
- Lake City Area Medical Center
- Hinsdale County's Wildland Fire Response Team
- Lake City Area Fire Protection District

Non-profit

- West Region Wildfire Council
- Lake Fork Valley Conservancy
- Lake City National Historic District

Local Business and Industry

- Chamber of Commerce

Neighboring Jurisdictions

- Archuleta County
- Gunnison County
- Mineral County
- La Plata County
- Ouray County
- San Juan County
- Saguache County

Integration with Other Community Planning Efforts and Hazard Mitigation Activities

Coordination with other community planning efforts is also paramount to the success of this plan. Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability from natural hazards. Hinsdale County uses a variety of comprehensive planning mechanisms, such as master plans and ordinances, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this plan establishes a credible and comprehensive plan that ties into and supports other community programs. Table 3-3 below provides a summary of the key existing plans, studies, and reports that were reviewed during the update process. Information on how they informed the update are noted where applicable.

Table 3-3 Summary of Key Plans, Studies and Reports

Plan, Study, Report Name	How Plan, Study or Report Informed the HMPC
Hinsdale County Community Wildfire Protection Plan (2011 Update)	Reviewed information on past wildfires and wildfire risk to inform the risk assessment
Colorado State Hazard Mitigation Plan (2018 Update)	Reviewed information on past hazards events and hazard risk information to inform the risk assessment Reviewed State goals and objectives
Colorado Drought Mitigation and Response Plan (2018 Update)	Reviewed information on past droughts and their impacts on the planning area. Incorporated information into the risk assessment
Colorado Flood Mitigation Plan (2018 Update)	Reviewed information on past flood events and risk analysis for the planning area to inform the risk assessment
Hinsdale County and Town of Lake City Community Plan (2018)	Informed the Community Profile and capability assessment.
The Climate Change in Colorado Report (2014) Western Water Assessment	Informed the climate change consideration section under the flood profile
Hinsdale County Zoning & Development Regulations (2011) and Town of Lake City Zoning Regulations (2017)	Informed the capability assessment
Survey of Critical Wetlands and Riparian Areas in Hinsdale County, Colorado (2008)	Informed the risk assessment section on flooding hazards.
Colorado Snow-Avalanche Area Studies and Guidelines for Avalanche-Hazard Planning (1979)	Informed the risk assessment section on avalanche hazards.
Hinsdale County Emergency Operations Plan (2017)	Informed risk assessment and capability assessment
Archuleta County Hazard Mitigation Plan (2018)	Archuleta County Response Area includes southern Hinsdale County; the recently updated plan informed the risk assessment where applicable.

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

3.3.2 Phase 2: Assess Risks

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

Section 4, Risk Assessment is the result of a comprehensive effort to identify and document all the hazards that have, or could, impact the planning area. This section was updated to reflect recent hazard events and current assets within the County and jurisdictions. Where data permitted, Geographic Information Systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities. The



HMPC conducted a capability assessment update to review and document the planning area's current capabilities to mitigate risk and vulnerability from natural hazards. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the HMPC can assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. A more detailed description of the risk assessment process and the results are included in Section 4. The capability assessment is included in Section 2 Community Profile.

3.3.3 Phase 3: Develop the Mitigation Plan

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

Wood facilitated a brainstorming and discussion session with the HMPC during their second meeting to update the goals and objectives from the 2014 plan. During the third HMPC meeting Wood facilitated a discussion session with the HMPC around a comprehensive range of mitigation alternatives, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. This included a review of progress on each action identified in the 2014 plan. Some new mitigation actions resulted from this process that were added to the plan in 2019. This process and its results are described in greater detail in Section 5.

Planning Step 8: Draft an Action Plan

Based on input from the HMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, Wood produced a complete first draft of the plan. This complete draft was shared electronically for HMPC review and comment. Other agencies were invited to comment on this draft as well. HMPC and agency comments were integrated into the second draft, which was advertised and distributed to collect public input and comments. Wood integrated comments and issues from the public, as appropriate, along with additional internal review comments and produced a final draft for the Colorado Division of Homeland Security and Emergency Management (DHSEM) and FEMA Region VIII to review and approve, contingent upon final adoption by the governing boards of each participating jurisdiction.

3.3.4 Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

To secure buy-in and officially implement the plan, the plan was adopted by the governing boards of each participating jurisdiction on the dates included in the adoption resolutions in Appendix C.

Planning 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. A discussion on the progress with implementation is included in Section 5. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. An overall implementation strategy is described in Section 7.

Finally, there are numerous organizations within the Hinsdale County planning area whose goals and interests' interface with hazard mitigation. Coordination with these other planning efforts, as addressed in Planning Step 3, is paramount to the ongoing success of this plan and mitigation in Hinsdale County and is addressed further in Section 7. An updated overall implementation strategy and maintenance and a strategy for continued public involvement are also included in Section 7.



SECTION 4 RISK ASSESSMENT

DMA 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.

Risk, for the purposes of this plan and as defined by FEMA, is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

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

This risk assessment builds upon the methodology described in the 2013 FEMA Local Mitigation Planning Handbook, which recommends a four-step process for conducting a risk assessment:

- 1) Describe Hazards
- 2) Identify Community Assets
- 3) Analyze Risks
- 4) Summarize Vulnerability

In essence, the risk assessment evaluates potential loss from hazards by assessing the vulnerability of the county's population, built environment, critical facilities, and other assets. Data collected through this process has been incorporated into the following sections of this chapter:

Section 4.1: Hazard Identification – Identifies the hazards that threaten the Planning Area (Hinsdale County) and describes why some hazards have been omitted from further consideration.

Section 4.2: Asset Summary - Describes the methodology for inventorying assets as the basis for determining vulnerability of the Planning Area to the identified hazards.

Section 4.3: Hazard Analysis and Risk Assessment - Discusses the threat to the Planning Area and describes previous occurrences of hazard events and the likelihood of future occurrences (2013 FEMA Local Mitigation Planning Handbook Risk Assessment, Step 1). It also includes a vulnerability assessment considering assets at risk, critical facilities, and future development trends (2013 FEMA Local Mitigation Planning Handbook Risk Assessment, Steps 2, 3 and 4).



4.1 Hazard Identification and Prioritization

DMA 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.

The first step in developing a risk assessment is identifying the hazards. The Hinsdale County Hazard Mitigation Planning Committee (HMPC) conducted a hazard identification study to determine the hazards that threaten the Planning Area and estimates of potential losses or assets that could be affected due to those hazards (if/as applicable).

4.1.1 Methodology and Results

Using the 2014 HMP, recent hazards data, other related plans and information and input gained through planning and public meetings, the HMPC agreed upon a list of hazards that could affect Hinsdale County. Hazards data was obtained from various federal, state, and local sources such as FEMA, the Colorado Geological Survey (CGS), the National Oceanic and Atmospheric Administration (NOAA) National Center for Environmental Information (NCEI), the United States Geological Survey (USGS), and others. Local newspaper articles from Lake City's Silver World were also used to research historic events. Together, these sources were examined to assess the significance of these hazards to the County. The hazards evaluated in this plan include those that have occurred historically or have the potential to cause significant human and/or monetary losses in the future.

In alphabetical order, the hazards identified and investigated for the Hinsdale County Hazard Mitigation Plan include:

Natural Hazards

- Avalanche
- Dam Incidents
- Drought
- Earthquake
- Flood
- Landslide
- Severe Thunderstorm Activity
- Severe Winter Storm
- Wildfire

Human Caused Hazards

- Acts of Terrorism/Imminent Threat
- Hazardous Materials (HazMat) Accidents
- Pandemic
- Power Outages/Utility Failure
- Transportation Accidents

Overall Hazard Significance Summary

Members of the HMPC used a hazards worksheet to identify and rate the significance of a variety of possible hazards based on their experience and knowledge of the Planning Area. Overall hazard

significance was based on a combination of Geographic Area coverage, Probability of Future Occurrence, and Potential Magnitude/Severity (e.g. Extent) as defined below. Table 4-1 summarizes the results of the risk assessment. The most significant hazards, based on the input from the HMPC as well as the results of the updated vulnerability assessment, listed alphabetically are: avalanche, drought, flood, landslide, severe winter storm, and wildfire. In most cases, the risk summary for the County also reflects the risk for the Town of Lake City.

Table 4-1 Hinsdale County Hazard Significance

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Avalanche	Limited	Highly Likely	Limited	High
Dam Incidents	Limited	Likely	Limited	Medium
Drought	Extensive	Likely	Critical	High
Earthquake	Extensive	Occasional	Critical	Medium
Flood	Significant	Highly Likely	Catastrophic	High
Landslide/debris flow/rockfall	Extensive	Highly Likely	Critical	High
Severe Thunderstorm Activity	Extensive	Highly Likely	Limited	Medium
Severe Winter Storm	Extensive	Highly Likely	Limited	High
Wildfire	Extensive	Highly Likely	Catastrophic	High
Imminent Threat/Terrorism	Limited	Unlikely	Moderate	Low
Hazardous Materials Accidents	Limited	Likely	Negligible	Low
Pandemic	Extensive	Occasional	Critical	Medium
Power Outages/Utility Failure	Significant	Likely	Critical	Medium
Transportation Accidents	Limited	Likely	Negligible	Low
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

Hazard Identification Changes from 2014 Plan

There was no change in the identified hazards from the 2014 Hinsdale County HMP and the overall hazard significance ratings have generally remained the same. The hazard profiles have been improved with



additional data and analysis. The 2019 planning process showed that recent hazard events have increased awareness of the interconnectedness of many hazards. Another difference of this plan compared to the 2014 HMP is that Climate Change considerations were added to each hazard profile. Climate change considerations are noted where the frequency and intensity of hazards might change in the future, where applicable.

4.1.2 Disaster Declaration History

One method used to identify hazards applicable for this HMP involved researching past events that triggered federal and state emergency or disaster declarations in Hinsdale County. Federal and state disaster declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond to such hazard event and have difficulty in recovering. 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 monetary or other assistance. In other words, a presidential disaster declaration puts federal recovery programs in place to help disaster victims, business, and public agencies.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), or the Small Business Administration (SBA). FEMA also issues emergency declarations, which are more limited in scope and come without the long-term federal recovery programs of major disaster declarations (Farm Service Agency 2018). The quantity and types of damage are the determining factors behind receiving these assistance sources. The following section focuses on state and federal disaster and emergency declarations.

Hinsdale County is among the many communities in Colorado that are susceptible to disasters. Details on federal and state disaster declarations were obtained by the HMPC, FEMA, and the Colorado Department of Homeland Security and Emergency Management (DHSEM) and compiled in chronological order in Table 4-2. A review of state and federal declared disasters indicates that Hinsdale County received 6 Governor's proclamations, 8 Federal Declarations, and 13 USDA Selectorial Declarations between 1970 and July 2019. Of these 26 proclamations and declarations, 5 were associated with severe storms; 5 were associated with wildfires (including 1 Fire Suppression Authority and 1 Fire Management Assistance); 3 were associated with flooding (1 flood event due to heavy rains and 1 flood and landslide event); 2 were due to snow related emergencies; and 15 were for drought.

Since 2005, there have been 13 drought declarations issued by the USDA's Secretary of Agriculture in Hinsdale County, 8 of which were Fast Track Secretarial disaster designations. According to the Secretary of Agriculture, a Fast Track designation is for a severe drought and provides an automatic designation when, during the growing season, any portion of the county meets the severe drought intensity value for eight consecutive weeks or more. Refer to the Drought hazard profile for more information of Disaster Declarations from the Secretary of Agriculture related to drought events.

This disaster history (combined federal and state) suggests that Hinsdale County experiences a major event worthy of a disaster declaration every 2 years, though this is somewhat skewed by the multiple USDA Fast Track declarations that can occur during a drought year. The County has a 53 percent chance of receiving a disaster declaration in any given year. Further, a review of these events helps Hinsdale



County and the Town of Lake City identify risk reduction targets and ways to improve capabilities to avoid large-scale hazard events in the future.

Table 4-2 Hinsdale County's State and Federal Disaster Declarations, 1970-2019

Event/ Hazard	Year	Disaster #	Declaration Type	Location
Heavy Rains and Flooding	1970	DR-293	Presidential—Major Disaster Declaration	Statewide
Flooding and Landslides	1973	DR-396	Presidential—Major Disaster Declaration	Statewide
Drought	1977	EM-3025	Presidential—Emergency Declaration	Statewide
Flood	1984	DR-719	Presidential – Major Disaster Declaration	Hinsdale (and 14 other counties)
Drought	1989		USDA	
Drought	1996		USDA	
Drought	2002		Presidential—Emergency Declaration	Statewide
Wildland fires	2002	DR-1421	Presidential—Major Disaster Declaration	Statewide
Missionary Ridge Fire	2002	FSA-2423	Fire Suppression Authorization	
Drought/Insects	2003	S1843	USDA	Hinsdale (and 24 other counties)
West Fork Complex Fire	2003	FM-503	Fire Management Assistance	
Snow Emergency	2003		Governor's Declaration	Statewide
Drought, Fire, High Winds, Heat	2005	S2327	USDA	
Severe Spring Snowstorm	2009		Governor's Declaration	Statewide
Severe Blizzard	2009		Governor's Declaration	Statewide
Drought, wind/high winds, heat/excessive heat	2012	S3260	USDA	Statewide
Winter Storms	2013		Governor's Declaration	Statewide
Wildfire	2013		Governor's Declaration	Hinsdale (and 2 other counties)
Drought - FAST TRACK	2013	S3539	USDA	
Drought - FAST TRACK	2013	S3545	USDA	
Drought - FAST TRACK	2013	S3548	USDA	
Drought – FAST TRACK	2014	S3715	USDA	



Event/ Hazard	Year	Disaster #	Declaration Type	Location
Drought – FAST TRACK	2018	S4320	USDA	
Drought – FAST TRACK	2018	S4329	USDA	
Drought – FAST TRACK	2018	S4347	USDA	
Drought – FAST TRACK	2019	S4481	USDA	
Avalanche Debris and Flooding	2019	D 2019 005	Governor’s Disaster Emergency Declaration	Hinsdale County, Town of Lake City

Source: 2018 Colorado State Hazard Mitigation Plan, FEMA, USDA

4.1.3 Overview of Hazard Identification and Risk Assessment

Section 4.3 contains detailed hazard profiles for the identified hazards. Each hazard profiled includes the following subsections:

- **Hazard/Problem Definition**—This section gives a description of the hazard in question and associated issues followed by details on the hazard specific to the Hinsdale County Planning Area.
- **Geographic Area** – This section gives a spatial description of the potential location or areas of Hinsdale County where the hazard expected to have an impact or generally occur.
- **Extent (Magnitude/Severity)**– This section gives a description of the potential strength or magnitude of the hazard as it pertains to Hinsdale County.
- **Previous Occurrences**—This section contains information on historical incidents, including impacts where known. Historical incident worksheets were used to capture information from participating jurisdictions on past occurrences.
- **Probability of Future Occurrence**—The frequency of past events is used in this section to gauge the likelihood of future occurrences. Where possible, frequency was calculated based on existing data. The likelihood of future occurrences is categorized into one of the following classifications:
 - **Highly Likely**—Near 100 percent chance of occurrence in next year or happens every year.
 - **Likely**—Between 10 and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less.
 - **Occasional**—Between 1 and 10 percent chance of occurrence in the next year or has a recurrence interval of 11 to 100 years.
 - **Unlikely**—Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.
- **Climate Change Considerations**—Descriptions of the potential for climate change to affect the frequency and intensity of the hazard in the future.
- **Vulnerability**—Following the hazard profiles is a vulnerability assessment for each identified hazard. The assessment was conducted through the study of potential impacts to the following specific sectors:
 - General Property
 - People
 - Critical Facilities and Infrastructure



- Economy
- Historic, Cultural, and Natural Resources
- Future Development
- Risk Summary - Summary of the key issues/problems based on threat, vulnerability and consequence to the Planning Area and jurisdictions from the specific hazard.

4.2 Assets Summary

4.2.1 Methodology

This vulnerability assessment is an attempt to quantify assets at risk, by jurisdiction where possible, to further define populations, properties, and critical facilities at risk to hazards identified in this plan. The methods of analysis vary by hazard type and data available.

Data to support the vulnerability assessment was collected and compiled from the following sources:

- GIS data (spatial data such as hazard threats, base layers like hydrology, boundaries, roads, etc., assessor's data)
- Written descriptions of inventory and risks provided by participating jurisdictions and the HMPC
- Existing plans, studies, and reports with relevant information
- Personal interviews with planning team members, hazard experts, and Hinsdale County and Town of Lake City staff

This section assesses the population, structures, critical facilities and infrastructure, and other important assets in the Planning Area as an initial consideration of risk to hazards identified in this plan. It begins with an inventory of people and buildings (total exposure) in the County to provide a baseline for evaluating vulnerability by hazard.

4.2.2 Assets Exposure

As a starting point for analyzing the Planning Area's vulnerability to identified hazards, the HMPC used a variety of data to define a baseline of property exposure against which disaster impacts could be compared. If a catastrophic disaster was to occur in the Planning Area, this section describes significant assets exposed or at risk in the Planning Area. Data used in this baseline assessment included:

- Total property assets at risk based on County Assessor's Office parcel values and a digital database of building footprints;
- Critical facility inventory;
- Cultural, historical, and natural resources; and
- Population growth and land use/development trends.

Total Assets at Risk

Hinsdale County Assessor data was used to inventory the total number and types of parcels in the County. The Assessor data provided total actual parcel values for the entirety of Hinsdale County as well as for the Town of Lake City within an abstract summary report. Detailed parcel data in GIS format was not available at the time the plan was updated. Table 4-3 below summarizes the total property exposure for the County and Lake City, based on the assessor's abstract report. Note that content values were calculated based on the following formulas based on FEMA methods: a) Residential properties received content values worth 50% of the improved values; b) Commercial, Agricultural, and Government related properties (including



State Assessed and Exempt parcels) received content values worth 100% of the improved values; and, c) Industrial properties received content values worth 150% of the improved values. Adding up these content and original improved values yields the Total Value of Improved Parcels, which is an estimation of the total property exposure within the County.

Table 4-3 Property Exposure Summaries by Jurisdiction and Parcel Type

Jurisdiction	Parcel Type	Total Improved Parcels	Actual Improved Parcel Values	Content Value of Improved Parcels	Total Value of Improved Parcels (Improved Values + Content Values)
Lake City	Vacant Land	127	\$8,734,960	--	\$8,734,960
	Residential Property	411	\$78,016,623	\$39,008,312	\$117,024,935
	Commercial Property	101	\$8,487,595	\$8,487,595	\$16,975,190
	Industrial Property	6	\$136,087	\$204,131	\$340,218
	Exempt Property	28	\$6,950,750	\$6,950,750	\$13,901,500
TOTAL		673	\$102,326,015	\$54,650,787	\$156,976,802
Unincorporated	Vacant Land	655	\$54,823,899	--	\$54,823,899
	Residential Property	1,020	\$192,045,141	\$96,022,571	\$288,067,712
	Commercial Property	152	\$7,821,375	\$7,821,375	\$15,642,750
	Industrial Property	4	\$2,162	\$3,243	\$5,405
	Agricultural Property	302	\$8,976,381	\$8,976,381	\$17,952,762
	Natural Resources Property	56	\$1,473,217	--	\$1,473,217
	Producing Mines Property	1	\$37,380	--	\$37,380
	State Assessed Property	15	\$3,308,300	\$3,308,300	\$6,616,600
	Exempt Property	14	\$4,701,290	\$4,701,290	\$9,402,580
TOTAL		2,219	\$273,189,145	\$120,833,160	\$394,022,305
GRAND TOTAL		2,892	\$375,515,160	\$175,483,947	\$550,999,107

Source: Hinsdale County Assessor's Office, 2018

In lieu of GIS-based parcel data, property specific analysis in relation to hazards utilized building footprint locations based on publicly available Microsoft/Open Street Map data. A limitation of this data is that it doesn't include property types or values. As such, for analysis purposes within this plan, an assumption was made that the buildings were of type "residential" so that an average property value was used based on an analysis of the Hinsdale County Assessor's Office data described in Table 4-3 above. The footprints informed loss estimations for flood, wildfire, landslide and avalanche hazards. A total of 1,997 footprints are located in Hinsdale County, with 548 of those in Lake City and 1,449 in the rest of the county (unincorporated portions). To estimate the potential exposure in terms of structure value an average structure value was applied to those buildings located in hazard areas, based off the numbers provided in the County's assessor's abstract report. The basis for the average valuation is shown in the table below, based again on the assessor's abstract report total residential parcels.



Table 4-4 Average Residential Structure Value Estimation by Jurisdiction

Location	Sum Improved Residential Parcels	Sum Residential Actual Value of Improved Parcels	Average Residential Values per Improved Parcel	Content Values per Improved Parcel (Residential)	Total Estimated Value per Improved Parcel (Residential)
Lake City	411	\$78,016,623	\$188,280	\$94,140	\$282,419
Unincorporated	1,020	\$192,045,141	\$189,821	\$94,911	\$284,732
TOTAL	1,431	\$270,061,764	\$378,101	\$189,051	\$567,152

Source: Hinsdale County Assessor's Office, Microsoft/Open Street Map Building Footprints, Wood Plc

Critical Facilities and Infrastructure

Critical Facilities (CFs) can be described as essential services, places, or key infrastructure and resources that are integral for day-to-day operations for the function of the county. These facilities are especially important to the county during and after a hazard event. Critical facilities include hospitals, schools, fire stations, communications infrastructure, transportation facilities, and more. Table 4-5 contains the inventory of these critical facility and infrastructure assets in Hinsdale County and the Town of Lake City in detail, while Table 4-6 summarizes the same information based on facility type and location. Some of the critical facilities were transferred from the county's previous HMP list, while the rest were either obtained from the Hinsdale County Building Office or the Homeland Infrastructure Foundation-Level Data (HIFLD) dataset, which includes facilities and structures nationwide. Once all the appropriate facilities and infrastructure locations were combined, the final dataset was incorporated into a GIS database for management, analysis, and mapping purposes. Figure 4-1 and Figure 4-2 show the location of these Critical Facilities in both Hinsdale County and Lake City, respectively.

In addition to these critical facilities, identified as point structures across the county, there are hundreds of miles of roads, overhead transmission lines, water and sewer lines, and other lifeline and transportation systems that are critical to the functionality, emergency service provision, and response operations of Hinsdale County.

Table 4-5 Detailed Critical Facility and Infrastructure Inventory by Jurisdiction

Jurisdiction	Critical Facility Name	Critical Facility Type	Address (If Available)	Totals
Lake City	Educational Media Foundation	FM Transmission Towers		
	Wee Care in Lake City	Day Care Facilities	425 N Henson St	
	Hinsdale County Emergency Medical Services and Lake City Volunteer Ambulance	Medical Care Facility	700 Henson St	
	Moseley Medical Center	Medical Care Facility	700 Henson St	
	Lake City School	Public Schools	614 N Silver St	
	Lake City Fire Station	Fire Stations	131 Henson St	
	Hinsdale County Sheriff's Office	Local Law Enforcement	311 N Henson St	
	Hinsdale County Courthouse	Admin or Government Bldg.	317 Henson St	
	Hinsdale County Post Office	Admin or Government Bldg.	803 Gunnison Av	



Jurisdiction	Critical Facility Name	Critical Facility Type	Address (If Available)	Totals
	Pete's Lake	Miscellaneous/Other		
	Lake City Public Library	Admin or Government Bldg.	206 Silver St	
	Well House 1	Water Facility		
	Well House 2	Water Facility		
	Armory and Town Offices	Admin or Government Bldg.	230 North Bluff St	
	Public Health	EMS Stations		
	CenturyLink Battery Storage	HazMat		
	Fuel Station	HazMat		
	Lake City Auto	HazMat		
Total				19
Unincorporated	Excomm, LLC (Round Top)	Cellular Towers		
	Password, Inc	FM Transmission Towers		
	North Fork Valley Public Radio, Inc	FM Transmission Towers		
	Hinsdale County Chamber of Commerce	FM Transmission Towers		
	AT&T Corp.	Microwave Service Towers		
	Town of Lake City	Microwave Service Towers		
	State of Colorado (Hill 71)	Microwave Service Towers		
	Town of Lake City 1	TV Analog Station Transmitters		
	Town of Lake City 2	TV Analog Station Transmitters		
	Tri-State Electric Substation	Electric Substations		
	Hinsdale County Road & Bridge Shop	Miscellaneous/Other	1775 N Highway 149	
	OHV Pilot Program (2019-2020) Route Startpoint	Miscellaneous/Other		
	OHV Pilot Program Route (2019-2020) Endpoint	Miscellaneous/Other		
	Hinsdale County Waste Transfer Station	WWTP	1775 N Highway 149	
	Lake City Wastewater Treatment Plant	WWTP		
	Lake City Communication Tower (Round Top)	Communication Towers		
	Lake City Water Tank (Round Top)	Water Facility		
	CDOT Road Shop	Miscellaneous/Other		
	Sportsman's Texaco Fuel Station	HazMat		
	Water Tank (Flats)	Water Facility		
Total				20
Grand Total				39

Source: Hinsdale County, HIFLD, Wood Plc



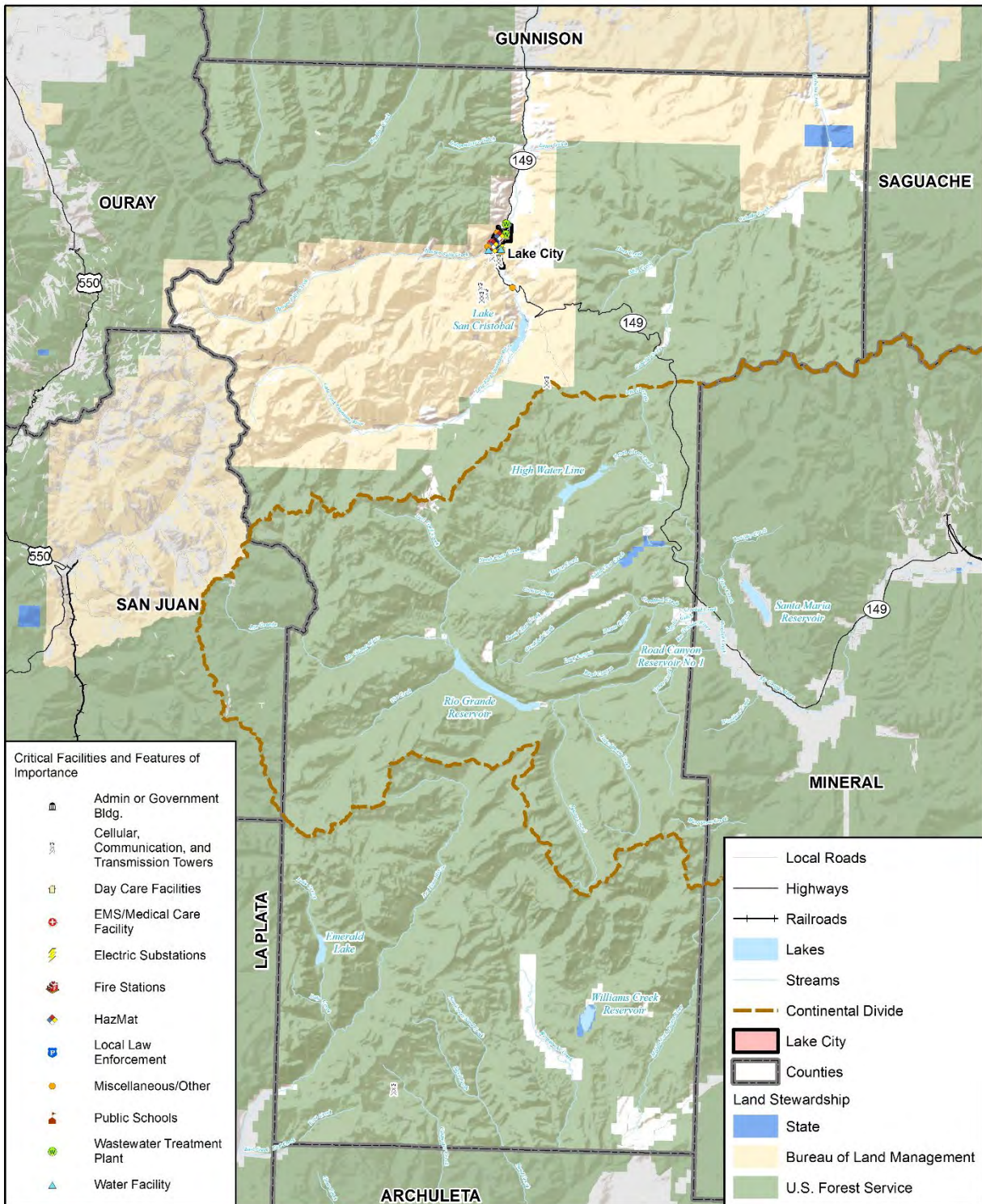
Table 4-6 Critical Facility and Infrastructure Summary by Facility Type and Jurisdiction

Jurisdiction	Critical Facility Type	Critical Facility Count
Lake City	Admin or Government Bldg.	4
	Day Care Facilities	2
	EMS Stations	1
	Fire Stations	1
	FM Transmission Towers	1
	HazMat	3
	Local Law Enforcement	1
	Medical Care Facility	2
	Miscellaneous/Other	1
	Public Schools	1
	Water Facility	2
TOTAL		19
Unincorporated	Cellular Towers	1
	Communication Towers	1
	Electric Substations	1
	FM Transmission Towers	3
	HazMat	1
	Microwave Service Towers	3
	Miscellaneous/Other	4
	TV Analog Station Transmitters	2
	Water Facility	1
	Wastewater Treatment Plant	2
TOTAL		19
GRAND TOTAL		38

Source: Hinsdale County, HIFLD, Wood Plc



Figure 4-1 Critical Facilities and Features of Importance in Hinsdale County

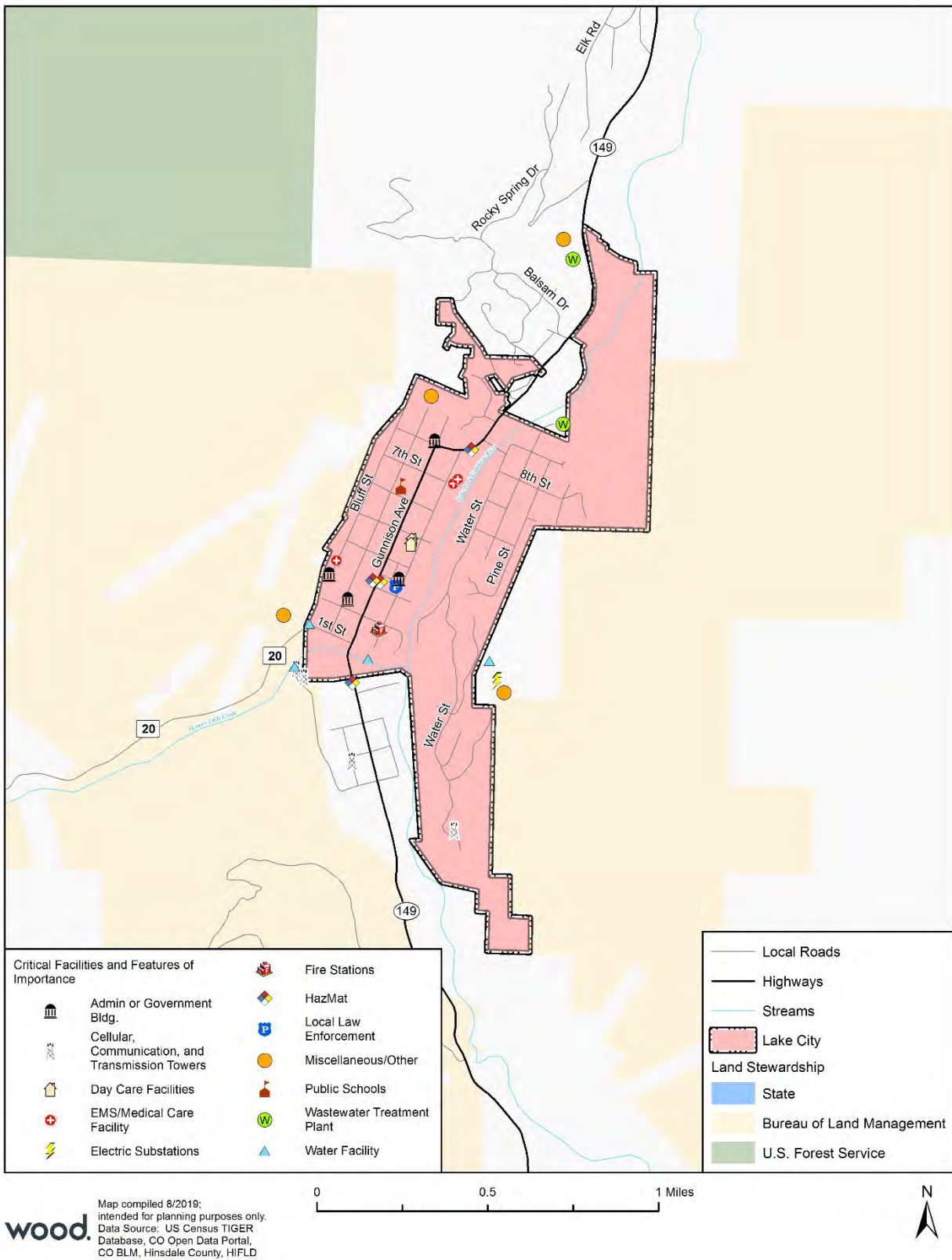


wood.
Map compiled 8/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, HIFLD,
Hinsdale County, CO BLM

0 10 20 Miles



Figure 4-2 Critical Facilities and Features of Importance in the Town of Lake City



Natural Assets and Historic/Cultural Resources

Natural resources are important for protection from hazards, and they also can help mitigate hazards. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

Hinsdale County's fauna, flora, spectacular views, and natural environmental assets draw visitors from around the world every year. The summer and autumn months are popular times for visitors and locals to participate in photography, fishing, hiking, biking, jeeping, four-wheeling, climbing, and enjoying the high-altitude weather. Fall through the spring months (winter months) are popular for hunting, fishing, backcountry skiing, ice-climbing, snowmobiling, photography, snowshoeing, cross-country skiing, and enjoying the solitude of high-altitude rural living.

Hinsdale County is home to elk, mule deer, moose, lynx, coyote, beaver, porcupine, and a plethora of other mammals. The skies, meadows, trees, and riverbanks are filled with variety of birds, and depending on the season they may include bald and golden eagles, magpies, Canadian geese, sand hill cranes, kingfishers, hummingbirds, red-winged blackbirds, ospreys, grouse, and wild turkey. Abundant fish populations in the area's rivers and lakes include rainbow trout, Brooke trout, native cutthroat trout, cut bow trout, brown trout, lake trout and kokanee salmon.

Wetlands are another important natural asset to the Planning Area that are vulnerable to the identified Hazards. Due to its high elevation Hinsdale County is comparatively moist relative to other areas in the West. Wetlands and riparian areas comprise less than 2% of the land area in Colorado but cover about 8% of Hinsdale County. Although these areas occupy relatively little of the landscape, they support an incredible amount of biodiversity. Mining, construction of reservoirs, water diversions, agriculture, grazing, and general community development have had impacts on wetlands. With limited areas of floodplains due to the rugged volcanic and glaciated landscape of Hinsdale County, fertile soils and available water for irrigation make productive areas for agriculture relatively scarce. Since the nineteenth century, hydrological diversions have been developed for irrigation and drinking water supplies.

The higher elevation of Hinsdale County is forested by mature strands of Aspen, Ponderosa Pine, Douglas Fir, Engelmann Spruce and other conifers, with shrubs, grasses, willows, and cottonwood dominating the valley floors.

Valuable mineral deposits brought early settlers to this area and, to a lesser degree, continue to be an important natural resource. Mineral extraction operations today are very few, however, the old mines are treasured historic assets of the county.

In addition to the natural resources presented above, the Slumgullion slide, Lake San Cristobal, the second largest natural lake in Colorado, and five fourteener mountains round out the area's diverse natural and environmental offerings. The Natural, Cultural, and Historical assets discussed herein, combined with overall tourism activities, provide the economic lifeblood of the county and as such their vulnerability to natural and human-caused hazards are of great concern. A significant fire event, for example, would not only have huge implications on the landscape, watershed, and fisheries; it would also have a tremendous economic impact on the county through loss of visitor revenues. This was the case during the 2019 HMP update planning process when the Town of Lake City was preparing for a major flood event after an unprecedented avalanche season. For more specifics on how each individual hazard has affected (or has

the potential to affect) natural assets or the tourism and economic assets of Hinsdale County, refer to each of the hazard profiles.

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 take into account identified at-risk species (threatened and endangered species) in the planning area. 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. An endangered species is any species of plant life or wildlife (birds, fish, mammals, etc.) that is in danger of extinction throughout all or most 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 there are ten Federal endangered, threatened, recovering, or candidate species in Hinsdale County. These species are listed in Table 4-7 along with state listed species. State special concern is not a statutory category but suggests a species may be in danger.

Table 4-7 Endangered Species Found in Hinsdale County

Common Name	Scientific Name	Type of Species	Status
Boreal Toad	Anaxyrus boreas boreas	Amphibian	Under Review
Gunnison sage-grouse	Centrocercus minimus	Bird	Threatened
Southwestern Willow flycatcher	Empidonax traillii extimus	Bird	Endangered
Yellow-Billed Cuckoo	Coccyzus americanus	Bird	Threatened
Colorado pikeminnow	Ptychocheilus Lucius	Fish	Endangered
Humpback chub	Gila cypha	Fish	Endangered
Pagosa skyrocket	Ipomopsis polyantha	Flowering Plant	Endangered
Uncompahgre Fritillary butterfly	Boloria acrocynema	Insect	Endangered
Canada Lynx	Lynx canaensis	Mammal	Threatened
North American Wolverine	Gulo gulo luscus	Mammal	Proposed Threatened

Source: U.S. Fish & Wildlife Service, Environmental Conservation Online System, Species by County Report

Historic and Cultural Resources

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

Historic properties and cultural resources are also valuable economic assets that increase property values and attract businesses and tourists. Far from being at odds with economic development, preservation of



these assets is often an important catalyst for economic development (e.g., historic downtown revitalization programs leading to growth in heritage tourism).

Information about historic assets in Hinsdale County came from local sources, the HMPC, and the following two historic inventories:

- **National Register of Historic Places.** 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.
- **Colorado State Register of Historic Properties.** 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 4-8 below lists the properties and districts in Hinsdale County that are on the Colorado State Register of Historic Properties and the National Register of Historic Places. All listed historic properties in the Planning Area are on both the State and National registers.

Table 4-8 Hinsdale County Historic Properties on State and National Registers

Property Name	Location	Date Listed
Lost Trail Station	81125 Forest Service Rd. 520	4/27/2011
Argentum Mining Camp	Address Restricted	9/28/1999
Capitol City Charcoal Kilns	Address Restricted	9/28/1999
Empire Chief Mine and Mill	Address Restricted	9/28/1999
Golconda Mine	Address Restricted	9/28/1999
Lake City Historic District	Roughly bounded by Bluff, Eighth, Lake, and First Streets	12/1/1978
Little Rome	Address Restricted	9/28/1999
Rose Lime Kiln	Co. Rd. 20 SW of Lake City	4/8/1993
Tellurium--White Cross Mining Camp	Address Restricted	9/28/1999
Tobasco Mine and Mill	S. of San Juan Co. Rd. 5 and Hinsdale Co. Rd. 34	10/16/2008
Ute--Ulay Mine and Mill	County Rd. 20	10/26/2017
Debs School	2783 McManus Rd.	4/28/2005

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

Economic Assets

Every community has specific economic drivers that are important to understand when planning to reduce the impacts of hazards and disasters to the local economy. Economic assets can be described in terms of direct or indirect losses; for example, building or inventory damage is direct, but functional downtime and loss of employment wages are indirect losses that can be calculated.



The economic sectors in Hinsdale County and Lake City include tourism/service sectors, government, private employers and commercial. Hinsdale County's primary employers are in the public sector, with Lake City Public School being the largest. The County, Town of Lake City, and CDOT are the next three highest employers in the Planning Area. There are no large employers in the agricultural, manufacturing, or retail sectors as these types of businesses are small family-owned, sole proprietor based, and seasonal. The Lake City Area Medical Center, also hosting the Emergency Medical Service stations, is vital to the community as an employer and of particular importance to seasonal, residential, and tourist populations. Direct loss of the school, medical center, County, or Town offices would have severe impacts on the County's ability to recover from a disaster, particularly since these entities are responsible for the actual disaster response.

As noted in the section above, several of the County and Town facilities are of Historic importance as well as the Historic District of Lake City. Direct losses of these homes and businesses would have an impact on the area's economy.

Hinsdale County's spectacular scenery is its primary economic asset, and hence a large part of Hinsdale County's economy is tourism-based due to the County's location in the Rio Grande National Forest and the San Juan Mountains of Southwest Colorado. Tourism is common in the summer and fall months when hikers, fishers, and hunters come to the area. The loss of campgrounds, R.V. parks, motels, or other lodging available for area visitors would have significant impact on the area through the loss of jobs and tourism revenue. Many of the area's natural treasures that draw visitors are highly vulnerable to the effects of natural hazards such as flooding, avalanches, landslides, and wildfire. Impacts to natural assets could result in reduced tourism related revenues and associated employment as well.

4.2.3 Development and Population Trends

As part of the planning process, the HMPC looked at growth and development trends in Hinsdale County. These trends are examined further in the context of each significant hazard, and how the changes in growth and development can affect loss estimates and overall vulnerability of property and populations.

The Town of Lake City and Hinsdale County have seen fluctuations in populations throughout their history. An initial surge of population in the late 19th century and early 20th century was caused by prospectors and miners descending on the area; this income of people was followed by steady decline and stagnation, which continued until the 1970's. Based on past population trends, it is probable that growth rates will fluctuate during the next 20 years. However, periods of slow growth or negative growth (i.e. population losses) could be sustained if the state and national economies stagnate, resulting in fewer newcomers and second homebuyers.

Table 4-9 below summarizes the development trends, specifically the total population, net migration, natural increase, and census building permits from 2010 to 2017 in Hinsdale County.

Table 4-9 Population Trends in Hinsdale County, 2010 -2017

Year	Total Population	Net Migration	Natural Increase	Census Building Permits
2010	843	10	6	2.25
2011	824	-17	-2	7
2012	801	-26	3	6

Year	Total Population	Net Migration	Natural Increase	Census Building Permits
2013	804	-2	5	3
2014	771	-35	2	4
2015	764	-9	2	4
2016	786	24	-2	6
2017	791	5	0	7

Source: Colorado State Demography Office

During the 2019 planning process the HMPC noted the following development trends with regards to hazards:

- Limited private land is available for development in the County due to the extensive amount of federal lands
- Some development is occurring in the Wildland Urban Interface,
- Some properties have been advertised for sale near avalanche runout areas.

The HMPC also noted that future development and redevelopment needs to take safety into consideration as well as historic preservation considerations.

The Colorado State Demography Office (COD) prepares population projections for counties using statistical models. Despite the decrease in population in recent years, the COD has projected that by 2050 Hinsdale's population will be at around 1,173, based on a 2015 population of 764 and a projected annual growth rate of 1.5% from 2015 to 2020. Figure 4-3 displays the population forecasts for Hinsdale County from the year 2000 to 2050. It is possible, with the combination of Lake City and Hinsdale County's high quality of life and the impending retirement of Baby Boomers, that Lake City and Hinsdale County could experience robust growth during the next 20 years (around 3.5% average annual growth).



Figure 4-3 Hinsdale County Population Forecast, 2000 – 2050



Source: Colorado State Demography Office

4.3 Hazard Analysis and Risk Assessment

4.3.1 Avalanche

Hazard/Problem Definition

An avalanche is a mass of snow sliding down a mountainside. An avalanche occurs when the stress from gravity, trying to pull the snow downhill, exceeds the strength (from bonds between snow grains) of the snow cover. There are four factors that contribute to an avalanche: a steep slope, a snow cover, a weak layer in the snow cover, and a trigger. About 90 percent of all avalanches start on slopes of 30-45 degrees; about 98 percent 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). Nevertheless, avalanches can run 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.

Avalanche hazards occur predominantly in the mountainous regions of Colorado above 8,000 feet. The clear majority of avalanches occur during and shortly after winter storms, during the winter and spring months between November and April. The most avalanche-prone months are, in order, February, March, and January. Avalanches caused by thaw occur most often in April (Source: Colorado Avalanche Information Center). The avalanche danger increases with major snowstorms and periods of thaw. About 2,300 avalanches are reported to the Colorado Avalanche Information Center in an average winter. More than 80 percent of these occur during or just after large snowstorms.

An increase in backcountry recreation (skiers and snowmobilers) in recent years has led to more people being in avalanche-prone areas. Another trend among backcountry skiers and snowboarders is traveling

into steeper and more “extreme” terrain, which tends to be more avalanche-prone. Additionally, new snowmobile models make it easier to access hazardous areas in the backcountry, and their bigger size and weight increases the likelihood of triggering an avalanche. Hinsdale County attracts hundreds of tourists every year due to the recreational activities available, some of which include snow related sports. Thus, avalanches pose a very real threat to people in the planning area, including local residents.

This hazard generally affects a small number of people, such as the participants in backcountry recreation or the residents in homes found in avalanche prone areas. Events have occurred in similar areas in Colorado and elsewhere where ten or more snowmobilers have been trapped and/or killed in a single avalanche event. Motorists along highways are also at risk of injury and death due to avalanches. Road and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches. Road closures can last several days until crews can clear debris safely. The potential for urban avalanches exists in Lake City, where large amounts of snow can slide off roofs and suffocate people, such as what occurred in Crested Butte in 2019 that resulted in a fatality. Recognizing areas prone to avalanches is critical in determining the nature and type of development allowed in each area.

The hazard has the potential for cascading impacts. The March 2019 avalanche cycle created massive debris dams that exacerbated the flood risk in the spring and summer months. Wildland fire crews were utilized to remove some of the woody debris to mitigate possible flooding and dam-failure type incidents.

Location

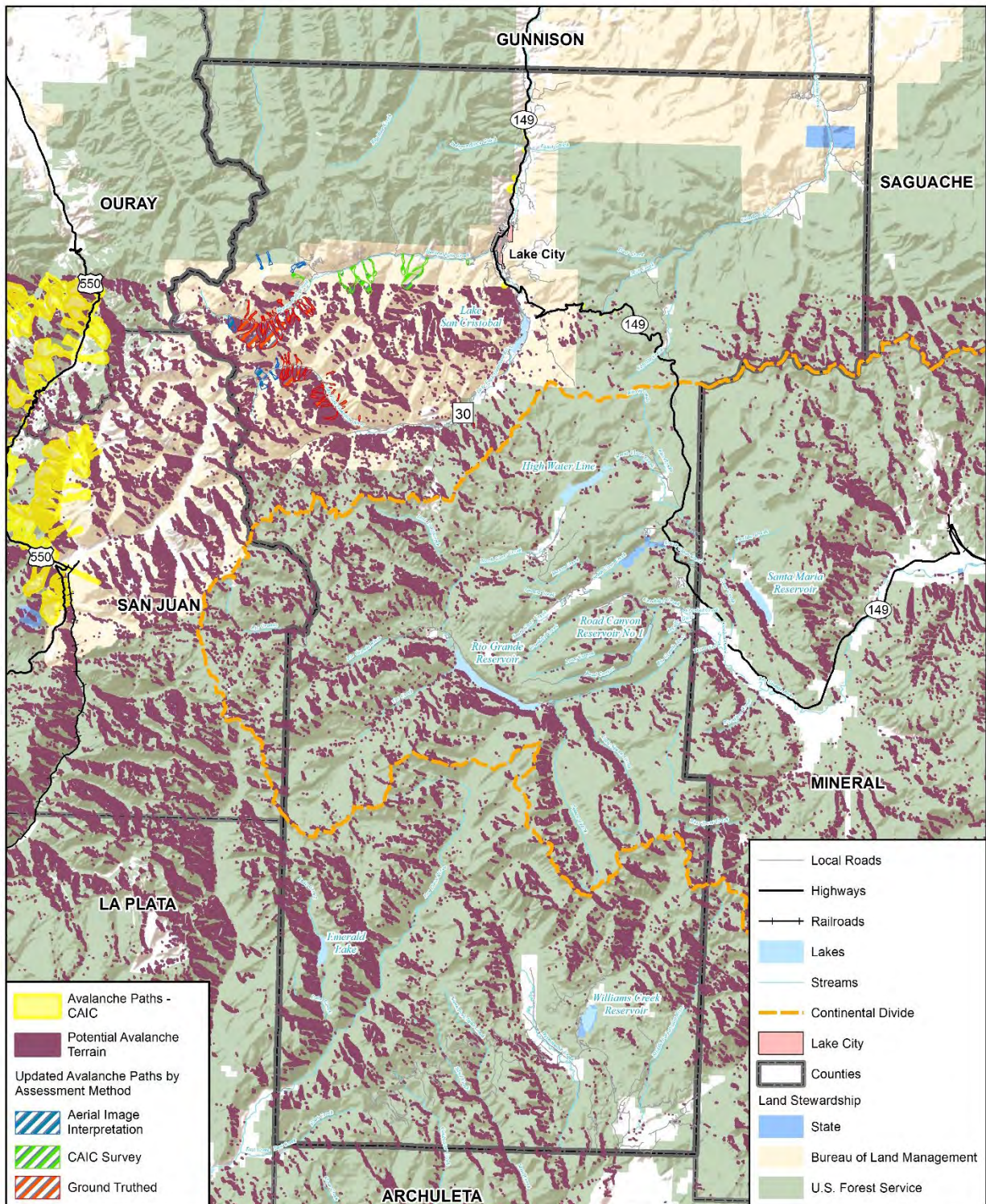
The San Juan Mountains form the dramatic scenery in southern Hinsdale County. Due to the steep mountainous terrain, high elevations, and winter snows in the county, most winters experience avalanches across parts of the county. There are several steep slopes with potential to trigger avalanches in various areas, however, particularly where the terrain slopes are 30 degrees or higher. Portions of the south, central-west, and northwest areas of the county exhibit these avalanche potential terrains, as shown in Figure 4-4 below. The avalanche potential layer was developed by the Archuleta County Sheriff’s Office using typical parameters for avalanche terrain common in the San Juan Mountains of Colorado:

- Slopes of 30 to 35 degrees or more
- North to East Aspect, where most wind loading occurs from prevailing snowstorms on southwest flow

The Digital Elevation Model (DEM) which made up this terrain dataset to meet the stated criteria was extracted from the 10-meter National Elevation Dataset using GIS. The results were then converted into vector polygons representing the hazardous terrain. The results are approximate and may not represent hazardous avalanche runout zones or areas that could be prone to slides on southern and western aspects, and because the dataset was generated with Archuleta County in mind, it does not cover the entire planning area (i.e. Hinsdale County) as is apparent in the figure.

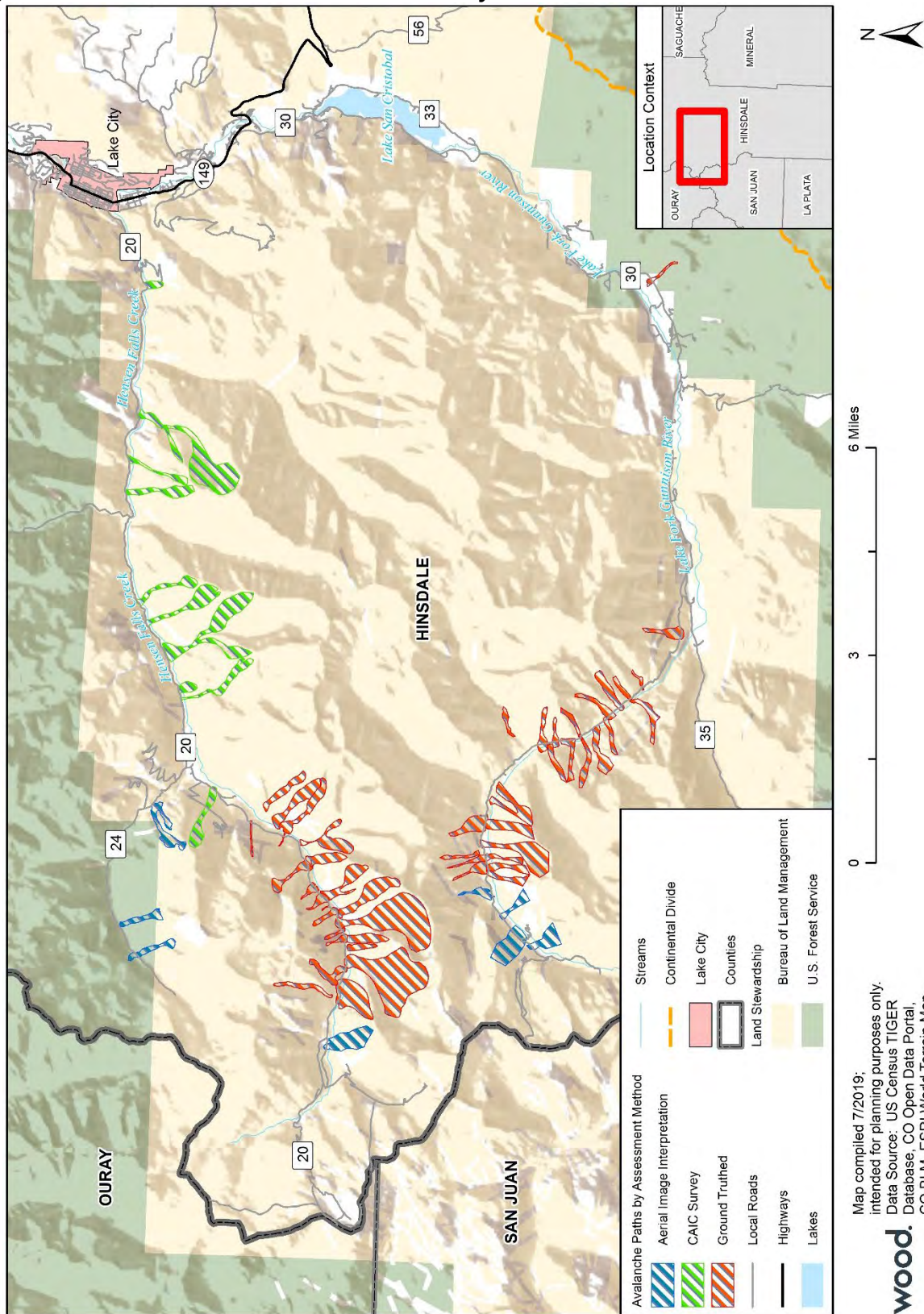
Based on the winter of 2018-2019 avalanche activity, however, field assessments and additional studies were carried out on the southwest of Lake City (along County Road 20, 33, and 35, near the boundaries of Ouray and San Juan Counties in the mountainous areas) to determine in more detail where the avalanche paths should be mapped. The results of a combination of aerial imagery interpretation of avalanche activity, Colorado Avalanche Information Center (CAIC) survey data, and ground-truthed data from site analysis is represented in Figure 4-5.

Figure 4-4 **Avalanche Paths and Potential Avalanche Terrain in South Hinsdale County**



wood. Map compiled 8/2019; intended for planning purposes only.
Data Source: US Census TIGER Database, CO Open Data Portal, CO BLM, CAIC, Archuleta County, CO DHSEM

Figure 4-5 Avalanches Paths in Hinsdale County Based on June 2019 Assessments



Extent (Magnitude/Severity)

Avalanches can result in injury, death and limited property damage in the County. A road closed due to avalanche activity can result in serious transportation disruptions as well as limited emergency response capabilities due to the limited number of roads in the County and minimal personnel. State Highway 149 can experience avalanche closures, thus obstructing access to the County seat (Lake City) from either the east or the north depending on the location of the avalanche. Backcountry avalanche incidents involve search and rescue teams and resources, which can put these personnel in areas of risk.

Previous Occurrences

Avalanches occur naturally in the winter months when snowfall and snow accumulation is prevalent in Hinsdale County. This discussion focuses on those avalanches that have impacted people or property, and hence been recorded due to incurring damage losses or injuring/killing people. According to CAIC data in the Colorado State Hazard Mitigation Plan there has been one fatality between 1950-2016. No further information was available. The 2018-2019 winter resulted in exceptional avalanche activity in March with the following impacts:

- March 12 - avalanche on County Road 30 – 1 home destroyed, 3 injuries
- March 13 – 4 homes damaged, 50 persons evacuated due to slides on the west side of Lake City
- The Rose Lime Kiln, a historic structure, was also impacted and damaged by avalanches in March
- The Turkey Foot slide put 20' of snow on Hwy 149
- Woody debris pushed into drainages exacerbated flood risk in spring/summer

Given the extensive mining activity in the county in its early days, it is likely Hinsdale County had numerous fatalities that much of southwestern Colorado experienced with winter mining activities in the late 1800's.

Below (Figure 4-6 and Figure 4-7) are a couple photos representative of the avalanche debris from the aftermath of March 2019 avalanches along County Road 20, taken in July 2019.

Figure 4-6 Photo of the March 2019 Avalanche Debris near Lake City County Road 20



Photo: Jeff Brislawn, July 2019

Figure 4-7 Photo of the March 2019 Avalanche Debris near Lake City above County Road 20



Photo: Jeff Brislawn, July 2019

Probability of Future Occurrences

Highly Likely—A 100 percent chance of occurrence in next year, meaning that it happens every year. Avalanches that result in death or injury happen less frequently, approximately once every 10 years.

Climate Change Considerations

The likelihood and nature of future avalanches may be affected by climate change. Winters are becoming shorter, which means there is potential for weaker snow accumulations at the very bottom of the snow pack. As more snow piles on top of the weak layer, and temperatures remain warm, the upper, moisture-laden layers became vulnerable to sliding. More extreme precipitation events that deposit large amounts of snow in a short period of time could also periodically increase the potential for large avalanches. The extent of avalanche activity and debris during the 2019 winter was unprecedented from both the HMPC and CAIC perspectives. The CAIC is studying the age of trees felled by the avalanches in 2019 to gain a better understanding of the recurrence interval of the extreme event; some trees were more than 250 years old (<https://coloradosun.com/2019/07/15/climate-research-avalanche-tree-rings/>).

Vulnerability

Overall, public safety is the primary concern regarding avalanche hazards and vulnerability. Building impacts are often limited. The following sections will discuss in more detail the specific impacts that property, populations, critical facilities and infrastructure, and other aspects of the county's way of life (the economy, local resources of interest, and future development) may be affected negatively by this hazard.

General Property

A GIS analysis using the limited avalanche hazard mapping available in 2019 was performed on the Microsoft building footprint database. The results did not indicate any buildings or properties located in identified avalanche hazard areas. However, based on past evidence, there has been some risk to structures where people reside, notably on the west side of Lake City along Bluff Street where no hazard mapping exists. On the east side of Lake City the HMPC noted that clearance of vegetation under the linear power line corridor for wildfire mitigation purposes may have increased potential for avalanches in this area. There is some existing residential development that could potentially be exposed, though the area is sparsely developed as of 2019.

People

Backcountry recreationalists, road crews, and motorists along the main roadways (Highway 149 and County Roads 20 and 30), are the most at risk to avalanche dangers. In addition, rising numbers of outdoor enthusiasts may lead to an increase in fatal avalanche occurrences, as avalanche events can be triggered by people's activities. Beyond backcountry skiing, there has been a growing interest in other forms of recreation such as snowmobiling and motorized and non-motorized snowbiking. Backcountry avalanche incidents involve search and rescue teams and resources, which can put these personnel at risk. The key actions to limiting impacts to individuals recreating in hazardous areas include spreading knowledge and awareness of the hazard and being properly equipped for self-rescue, if necessary, with tools such as locator beacons, shovels, GPS units and other communication tools and probes.

Excessive winter storm cycles may result in risk to people in structures, though GIS analysis did not indicate specific structures at risk; this could be in part due to a data limitation. As noted in the Previous Occurrences section during the March of 2019 one home was destroyed with three persons injured along County Road 30 and at least 12 homes were urged to voluntarily evacuate near the Bluff Street area (Lake City). The HMPC added the following impacts from the 2019 event: a Lake City Heights house was hit by an avalanche while occupied that resulted in property damage; one seasonal backcountry cabin was destroyed.

Critical Facilities and Infrastructure

Based on available GIS-based hazard mapping at the time this plan was updated there were not any critical facilities located in identified avalanche hazard areas. The HMPC noted that avalanches have impacted an electric substation in the past on the east side of Lake City; the potential for avalanche risk has been increased in part by wildfire mitigation beneath power lines in the area. Other utility lifelines could potentially be at risk as well, such as communication towers, electrical posts, power stations, water distribution lines, and pipelines.

Key infrastructure known to be at risk includes transportation routes and systems such as Highway 149, County Road 30, and County Road 20. The risk to the road infrastructure has increased since 2019, due to

the clearing of trees by avalanches in many cases that ran to valley bottoms. These roads could be obstructed or shut down, causing issues with transportation of goods, commuting, and emergency response and service provision. A road closure due to avalanche activity on Highway 149 can also result in serious transportation disruptions due to the limited number of roads in the County. State Highway 149 near the Slumgullion Pass sometimes experiences avalanche closures, thus obstructing all access to the County seat (Lake City) from the east and south.

Economy

Avalanche activity inside or outside the County (along connecting roadways) can disrupt transportation in and out of the local communities, which could result in temporary economic impacts. Tourism is the main economic driver for Hinsdale County, and a major closure of roads could leave Lake City and the unincorporated portions without this vital sector, even during non-winter months. For example, with the recent 2018-2019 winter resulting in exceptional avalanche activity in the county, County Roads 20 and 30, roads popular with tourists and snowmobiles were closed for several weeks due to significant avalanche debris piles of wood and snow. The closures of popular routes and potential extreme flooding hazards during the snowmelt in late spring and summer of 2019 resulted in fewer visitors.

Historic, Cultural, and Natural Resources

A GIS analysis of historic properties did not indicate risk of avalanche based on the CAIC paths dataset. This mapping is limited, however. The HMPC noted the Rose Lime Kiln was impacted in Lake City in 2019. There are also historic mining sites likely to be at risk throughout the county.

Significant damage occurred to forests below avalanche runout zones during the 2019 avalanche cycle. This also disturbed stream habitat with debris piles, and debris removal costs were incurred by the County.

Future Development

Avalanche vulnerability could increase to a degree with future development and population growth as there will be a higher number of people driving on roadways and taking part in backcountry recreation, as well as potentially requiring search and rescue and emergency response and services. Risk to structures can potentially increase without careful siting and planning. It was observed in 2019 that land was for sale in areas of close proximity to avalanche runout zones along segments of County Road 20 popular with second/seasonal home property.

Figure 4-8 Land for Sale Near Avalanche Runout on County Road 20



Photo: Jeff Brislawn

Risk Summary

Overall, avalanche hazards have a **High Significance** in Hinsdale County based on historical impacts and the potential for death and injury.

- *Effects on people:* Backcountry recreationalists, road crews, and motorists along the main roadways are the most at risk to avalanche dangers. There is potential risk to residential areas in Lake City during extreme avalanche cycles.
- *Effects on property:* Historic incidents have affected residential property. At the time this plan was updated there were not any buildings located in identified avalanche hazard areas, but there are limited areas of the County mapped.
- *Effects on economy:* Avalanche activity inside or outside the County (along connecting roadways such as Highway 149) can disrupt transportation in and out of the local communities, which could result in a wide range of economic impacts particularly to the tourism industry.
- *Effects on critical facilities and infrastructure:* At the time this plan was developed there were not any Critical Facilities located in identified avalanche hazard areas, but this might be due to data limitations. Key infrastructure at risk would include transportation routes and systems (e.g. Highway 149 and County Roads 20 and 30) and utility lifelines (e.g. communication towers, electrical substations).
- *Related Hazards:* Severe Winter Storm, Landslide and Debris Flows, Flood, Power Outages, Dam Incident, Transportation Accidents.

Table 4-10 Avalanche Risk Summary

Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Hinsdale County	Limited	Highly Likely	Critical	High
Lake City	Limited	Occasional	Critical	High

4.3.2 Dam Incidents

Hazard/Problem Definition

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

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

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

Controlled release or spillway flooding: inadequate spillway capacity often results in excess overtopping flows, though the potential for flooding as a result of discharge from dam outlet structures or spillways could be expected during excessive rain events. However, controlled releases of water from dams is a measure that can prevent or minimize spillway flooding or structure failure, by regulating capacity in a managed way. Even controlled releases can lead to unwanted or unpredicted flooding, depending on environmental and weather conditions, or even human error.

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



then decline until the reservoir is empty. And, a concrete gravity dam can fail instantaneously or gradually with a corresponding buildup and decline of the flood wave.

Location

According to the National Inventory of Dams (NID) database, updated as of 2018, there are 22 dams of concern (in addition to the Lake San Cristobal outlet) to Hinsdale County which have been constructed for flood control, irrigation storage, recreation, and stock watering purposes. Of these dams, 4 are considered high hazard, although Lake San Cristobal could also be considered a high hazard natural feature even if it is not part of the NID inventory. Besides these high hazard dams, 6 others are rated as significant hazard dams to the county, and 12 others are classified as posing low hazards to the county.

Table 4-11 details the high and significant hazard dams affecting Hinsdale County. The majority of these dams are in the Rio Grande Headwaters watershed, with three dams in the Upper Gunnison watershed and one in the Piedra watershed. Most dams are located in the central and eastern portions of the county, though Williams Creek Dam is located in the southeast of Hinsdale, and a few are in the north/northeast portion of the county. Both Lake City and the unincorporated areas are at risk of damage from flooding in the event of a dam failure. The low hazard dams are summarized in Table 4-12.

Table 4-11 Hinsdale County Dams of Concern Characteristics

Hazard Rating	Dam/Reservoir Name	Drainage	Downstream Community	Dam Type	Dam Height (in Feet)	Storage Capacity (Acre-Feet)	Emergency Action Plan?
High	Continental	North Clear Creek	South Fork	Earth	120	30,707	Yes
High	Rio Grande	Rio Grande River	Creede	Earth	117	73,800	Yes
High	Williams Creek	Williams Creek	Piedra	Earth	100	14,543	Yes
Significant	Mill Creek Dam No 1	Mill Creek	--	Earth	18	40	Not Required
Significant	Mill Creek No 2	Millcreek	--	Earth	18	20	Not Required
Significant	Rito Hondo	Rito Hondo	South Fork	Earth	50	766	Yes
Significant	Road Canyon #1	Road Canyon Creek	Creede	Earth	26	2,213	Yes
Significant	Troutvale #1 (Upper Browns Lake)	South Clear Creek	South Fork	Earth	12	660	Yes
Significant	Troutvale #2 (Lower Browns Lake)	South Clear Creek	South Fork	Earth	15	600	Yes

Source: National Inventory of Dams, 2018

Note: 1 acre-foot = 325,851 gallons



Table 4-12 Low or Undetermined Hazard Dams that Could Affect Hinsdale County

Hazard Rating	Dam/Reservoir Name	Drainage	Downstream Community	Dam Type	Dam Height (in Feet)	Storage Capacity (Acre-Feet)	Emergency Action Plan?
Low	Castle #4 (Pearl Lake)	North Clear Creek	South Fork	Earth	18	167	Not Required
Low	Frank B. Watters	Lake Fork Gunnison River	Delta	Earth	23	287	Not Required
Low	Hermit #1	South Clear Creek	South Fork	Earth	13	749	Not Required
Low	Hermit #2	South Clear Creek	South Fork	Earth	10	633	Not Required
Low	Hermit #4	South Clear Creek	South Fork	Earth	12	356	Not Required
Low	Lost Lake #1	Lost Lake Creek	South Fork	Earth	22	1,181	Not Required
Low	Regan	House Canyon Creek	South Fork	Earth	17	1,007	Not Required
Low	S. Lazy U	Crooked Creek	South Fork	Earth	11	245	Not Required
Low	Squaw Lake	Squaw Creek	--	Earth	12	162	Not Required
Low	Trout Lake	West Trout Creek	South Fork	Earth	15	338	Not Required
Low	Wee Ruby	Texas Creek-Tr	South Fork	Earth	13	264	Not Required
Undetermined *	Hidden Treasure	Henson Falls Creek	Lake City	Concrete	NA	NA	Not Required
Undetermined *	Ute Ulay	Henson Falls Creek	Lake City	Concrete	NA	NA	Not Required
Undetermined **	Lake San Cristobal	Lake Fork of Gunnison River	Lake City	--	--	30,400	Not Required

Source: National Inventory of Dams, 2018

Note: 1 acre-foot = 325,851 gallons

*These are historic, decommissioned dams; ** Lake San Cristobal is a natural lake but has a manmade outlet structure which can sometimes cause flooding downstream during high runoff years.

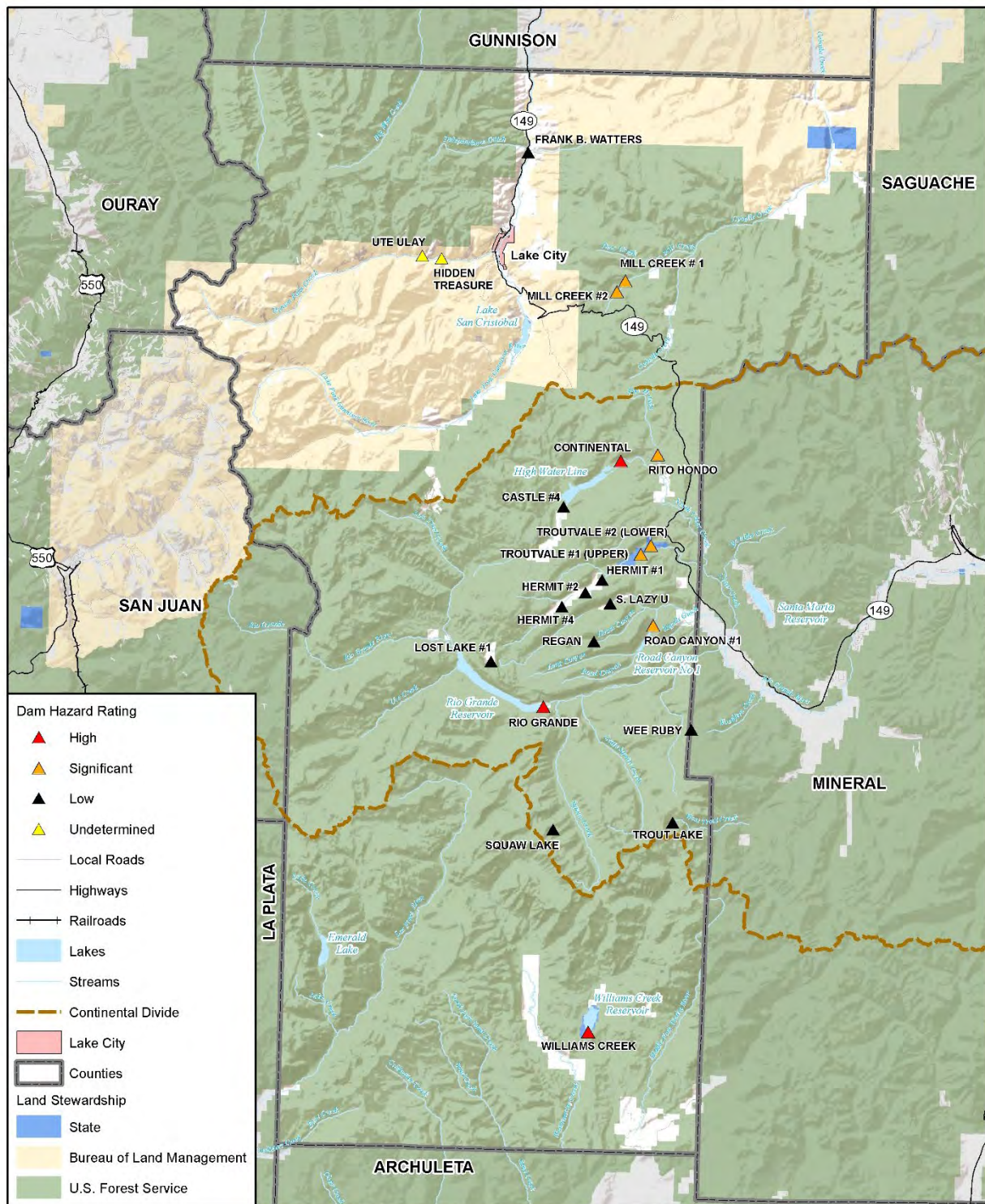
Figure 4-9 illustrates the locations of identified dams within Hinsdale County, or which could potentially flood into the County, including their major drainages. Figure 4-10 displays the dam inundation areas for several of the significant and high hazard dams in the county. Dam inundation extents were mapped and used in analysis throughout this chapter based on GIS layers for the following available significant or high hazard dams: Continental Dam, Rio Grande Dam, Rito Hondo Dam, Road Canyon #1 Dam, Troutvale #2 (Lower) Dam, and Williams Creek Dam. The Colorado Dam Safety Program office provided the dam inundation maps based on latest and best available data. As of 2019 consultants for the San Luis Valley Irrigation District are working on a dam and reservoir rehabilitation study for the Rio Grande Reservoir for



the purpose of allowing the reservoir to be safely operated at a higher capacity, with storage at higher stages carried over from one year to the next.



Figure 4-9 Dams of Concern to Hinsdale County



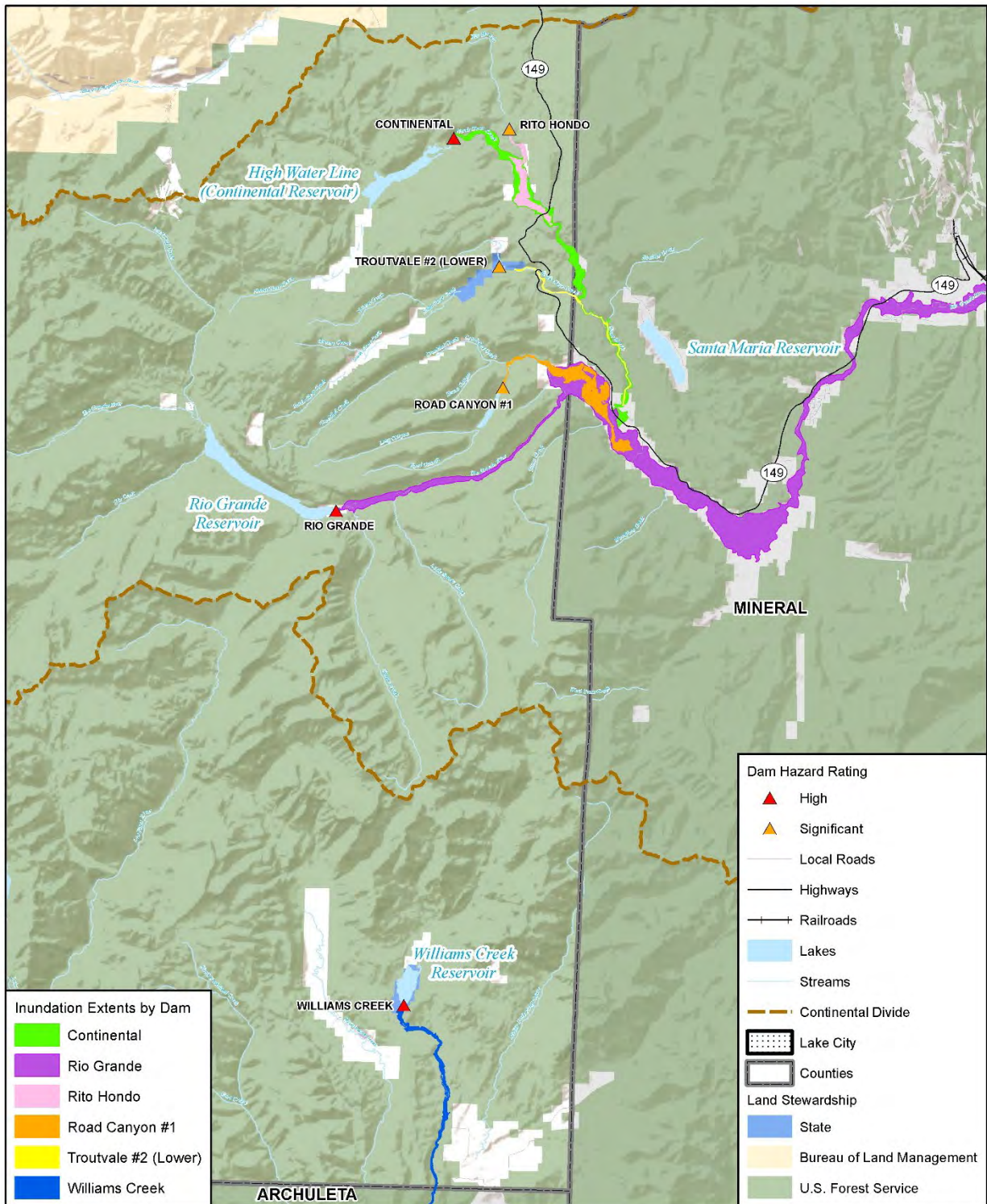
wood.

Map compiled 6/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, NID 2018,
CO BLM, CO DNR

0 10 20 Miles



Figure 4-10 Dam Inundation Areas for Dams in Hinsdale County



wood.
Map compiled 5/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, NID 2018,
Colorado Dam Safety Program, CO BLM

0 5 10 Miles



Extent (Magnitude/Severity)

Standard practice among federal and state dam safety offices is to classify a dam according to the potential impact a dam failure (breach) would have on downstream areas. The hazard potential classification system categorizes dams based on the probable loss of human life and the impacts on economic, environmental and lifeline facilities. Per the U.S. Army Corps of Engineers and National Inventory of Dams standards, dams are classified in three categories that identify the potential hazard to life and property, and one that indicates unknown risk:

- *High* hazard indicates that a failure would most probably result in the loss of life;
- *Significant* hazard indicates that a failure could result in appreciable property damage;
- *Low* hazard indicates that failure would result in only minimal property damage and loss of life is unlikely.
- *Undetermined* hazard dams have not been rated or their hazard rating is not known.

Since the County has a total of nine High and Significant hazard dams there is potential for loss of life and property damage. There are non-rated and historic 'dams' including the outlet structure at Lake San Cristobal that can pose flooding risks as well. The HMPC noted that the Crooks Falls Diversion can also pose potential problems. Both unincorporated and incorporated areas of the County are identified on dam inundation maps included in various dam Emergency Action Plans. The inundation areas for each of the dams are generally downstream and include large rural and urban areas below the dams. Adjacent jurisdictions could also be affected by a dam or reservoir failure in Hinsdale County. These include, depending on the dam involved and to a limited extent, the Counties of Mineral and Archuleta.

The extent of impacts depends on the nature of failure and location of the dam. The largest population potentially at risk would be in Lake City. Unincorporated areas across the county and nearby counties, particularly Piedra, Creede (Mineral County), Del Norte (Rio Grande County), and South Fork (Rio Grande County), could also be impacted were a dam to fail and significantly flood downstream.

Previous Occurrences

The Lake San Cristobal outlet is reported to have had an incident around 1954, with locals speaking of bridges below the structure being washed out (around Vickers), though currently there are no other details available about this event.

The Hidden Treasure Dam on Henson Creek has had incidents in the past. It flooded Lake City with silt back in 1974 and had a general failure flooding event two years previous, in 1972. In subsequent years this dam, a historic structure, was decommissioned so it no longer held water back. The dam was again a concern following the high snowpack winter of 2018/2019. Avalanches had brought woody debris into the drainage with the possibility of plugging the hole in the bottom of the dam. Due to these concerns a portion of the historic dam was removed to ensure passage of water and avoid consequences to Lake City downstream.

Probability of Future Occurrences

Occasional—The County remains at risk to dam failures from numerous dams under a variety of ownership and control and of varying ages and conditions. Given the number of dams of concern in Hinsdale County the potential exists for future dam or reservoir failures. Uncontrolled or controlled

release flooding as well as spillway flooding below dams due to excessive rain or runoff are more likely to occur than failures.

Climate Change Considerations

The potential for climate change to affect the likelihood of dam failure is not fully understood at this point in time. With a potential for more extreme precipitation events a result of climate change, this could result in large inflows to reservoirs. However, this could be offset by generally lower reservoir levels if storage water resources become more limited or stretched in the future due to climate change, drought and/or population growth.

Vulnerability

A dam incident can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to dam failures is confined to the areas and populations subject to inundation downstream of the facility. Secondary losses would include loss of the multi-use functions of the dam itself and associated revenues that accompany those functions.

GIS analysis was carried out using dam inundation extents from the Colorado Dam Safety Program's office as well as Microsoft Footprints, to overlay each dam inundation layer with the buildings in the county to arrive at total units at risk. The dam inundation areas by dam in the county are displayed in Figure 4-10 and the results of the overlay analysis explained in more detail in the sections below.

General Property

In general, communities located below a high or significant hazard dam and along a waterway are potentially exposed to the impacts of a dam failure. For reference, high hazard dams threaten lives and property, significant hazard dams threaten property only. Inundation maps that identify anticipated flooded areas (which may not coincide with known floodplains) are produced for many high hazard dams. Six of the high or significant hazard dams contained dam inundation extents in spatial form that were analyzed to quantify risk across the planning area. Table 4-13 summarizes the totals calculated from tallying up the buildings which overlapped with inundation extents, while Figure 4-6 displays these dam inundated buildings in map form. To estimate potential people at risk, the average persons per household of the County of Hinsdale was multiplied by the total number of buildings falling within the dam inundation extents. Note that due to lack of information on the type of building found in these extents, it is difficult to truly know whether people inhabit said properties. As such, these are rough estimates of at-risk (or exposed) populations.

According to the analysis of the dams with a potential to impact the planning area, the Rio Grande Dam has the greatest potential downstream impacts, followed by the Road Canyon #1 Dam, the Rito Hondo Dam, and the Continental Dam. Portions of the unincorporated areas of the middle and southern portions of the county are at risk. The Town of Lake City is not within a mapped inundation area but could potentially have impacts from incidents involving Lake San Cristobal's outlet structure. The potential magnitude of a dam failure depends on the time of year and the base flow of the river when the failure occurs. During the late spring and early summer months, when the river flows may be higher, the impact to the area would be much greater and evacuation times even shorter.

Table 4-13 Estimated Buildings Affected by Dam Inundation Extents in Hinsdale County

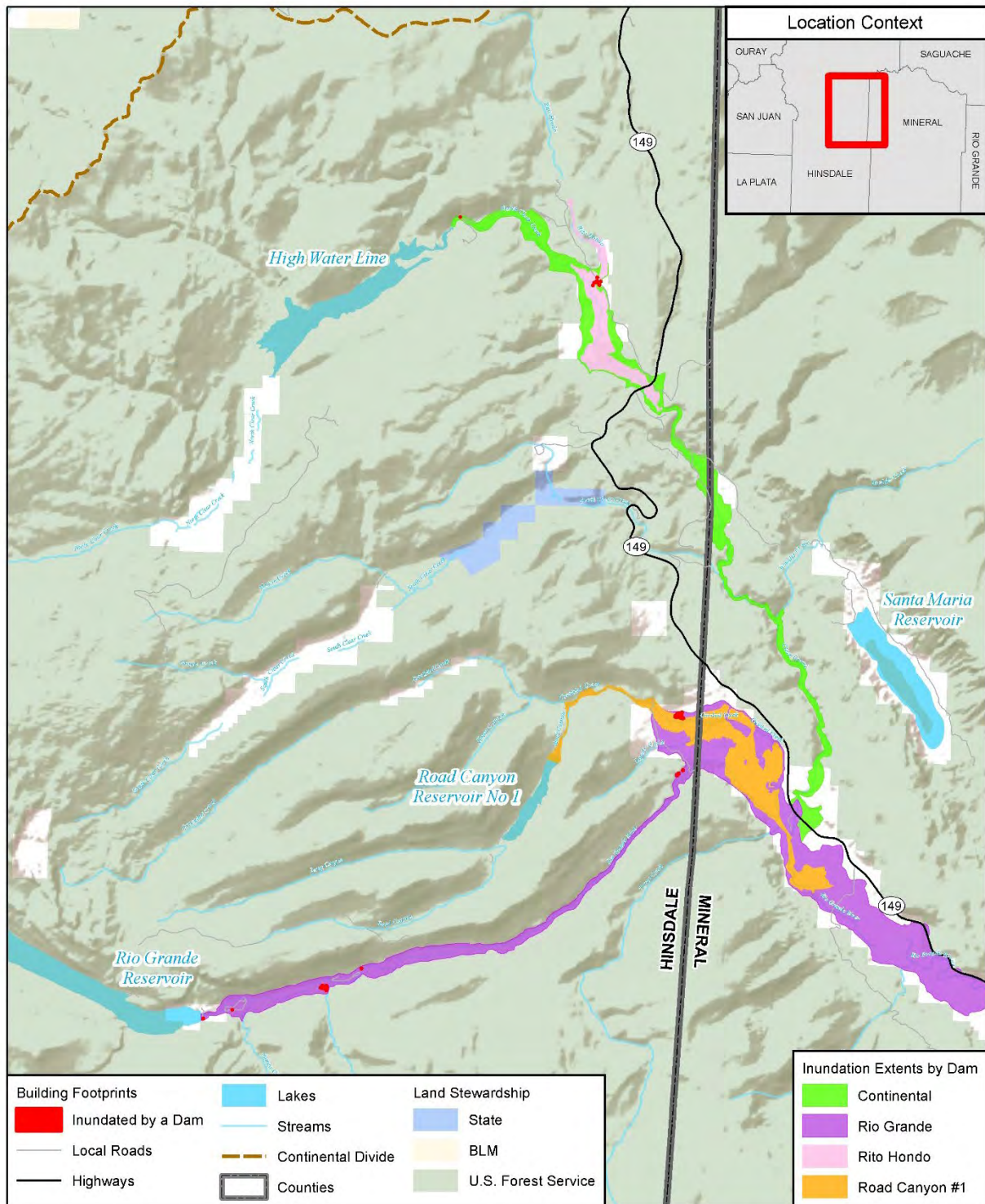
Jurisdiction	Dam	Building Count	Estimated Residential Values	Content Values	Total Values	Loss Estimates (100% of the Total Values)	Population
Unincorporated	Continental	4	\$753,118	\$376,559	\$1,129,677	\$1,129,677	9
	Rio Grande	22	\$4,142,150	\$2,071,075	\$6,213,225	\$6,213,225	49
	Rito Hondo	6	\$1,129,677	\$564,839	\$1,694,516	\$1,694,516	13
	Road Canyon #1	14	\$2,635,914	\$1,317,957	\$3,953,871	\$3,953,871	31
TOTAL		46	\$8,660,859	\$4,330,430	\$12,991,289	\$12,991,289	102

Source: Hinsdale County, Colorado Dam Safety Program, NID 2018, Microsoft Footprints/Open Street Map, Wood Plc analysis

Dam failure- or reservoir-based flooding presents a threat to life and property, including impacts to buildings, their contents, their use, and the people living within. Large flood events can affect crops and livestock as well as lifeline utilities (e.g., water, sewerage, and power), transportation, jobs, tourism, the environment, and the local and regional economies.



Figure 4-11 Buildings in Dam Inundation Areas in Hinsdale County



wood.
Map compiled 5/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, CO BLM,
Microsoft Footprints, NID 2018,
Colorado Dam Safety Program

People

Persons located underneath or downstream of a dam are at risk of a dam failure, though the level of risk can be tempered by topography, amount of water in the reservoir/dam, and time of day of the breach. Injuries and fatalities can occur from debris, bodily injury, and drowning. Once a dam has breached, standing water presents all the same hazards to people as floodwater from other sources. People in the inundation area may need to be evacuated, cared for, and possibly permanently relocated. Impacts could include hundreds of evacuations and possibly casualties, depending on the dam involved. Specific population impacts are noted in Table 4-3, and total people at risk were calculated by multiplying the average number of persons per household in the county of (which equals 2.22) times the number of building footprints where dam inundation occurs. The Rio Grande Dam would put the most people at risk. A total of 102 people could be at risk based on the calculation methodology used, though again it is unlikely that all the buildings found to overlap with dam inundation extents will be populated by the total persons estimated.

Critical Facilities and Infrastructure

A total dam failure can cause catastrophic impacts to areas downstream of the water body, including critical infrastructure. Any critical asset located under the dam in an inundation area would be susceptible to the impacts of a dam failure. Of particular risk would be roads and bridges that could be vulnerable to washouts, further complicating response and recovery by cutting off impacted areas. However, based on the critical facility inventory considered in the updating of this plan, 0 critical facilities were found to intersect with the dam inundation extents obtained in GIS form from the Colorado Dam Safety Program. That does not mean that a potential dam failure or inundation event would not have some impact, even if secondary, to facilities or structures deemed essential to the county, as low hazard dams could still impact critical facilities even if they are not analyzed due to lack of Emergency Action Plan or if inundation boundaries have not been mapped. In addition, there are 2 undetermined hazard rank dams in the county that could cause significant damage downstream if they were to fail or flood.

Economy

Extensive and long-lasting economic impacts could result from a major dam failure or inundation events, including the long-term loss of water in a reservoir, which may be critical for potable water needs. A major dam failure and loss of water from a key structure could bring about direct business and industry damages and potential indirect disruption of the local economy.

Historic, Cultural, and Natural Resources

Dam or reservoir failure effects on the environment would be similar to those caused by flooding from other causes. Water could erode stream channels and topsoil and cover the environment with debris. For the most part the environment is resilient and would be able to rebound from whatever damages occurred, though this process could take years. However, historic and cultural resources could be affected just as housing or critical infrastructures would, were a dam to fail and cause downstream inundation that could further erode surfaces or cause scouring of structural foundations. GIS analysis indicates there are no historic properties or structures at risk to dam inundation based on the Colorado Dam Safety Program inundation extents available.

Future Development

Areas slated for future development should take into consideration potential impacts from dam failure risk upstream and should attempt to overlay the existing dam inundation maps with proposed future development. Also, of note is that development below a low or undetermined hazard dam could increase its hazard rating. Finally, added development could compromise dams and reservoir resources if populations depend on them for critical needs such as potable water.

Risk Summary

The overall significance of dam inundation in Hinsdale County is Medium.

- *Effects on people:* A total of 102 people could be at risk of dam failure events based on the dam inundation extent analysis with building footprints.
- *Effects on property:* A total of 46 buildings could be at risk of dam failure events based on the dam inundation extent analysis with footprints, with over \$12.9 million in total values at risk.
- *Effects on economy:* A dam failure and loss of water from a critical reservoir or structure could include direct and indirect business and industry damages or disruption of the local economy and key county resources (e.g. potable water).
- *Effects on critical facilities and infrastructure:* No critical facilities were found to be at risk of dam inundation extents based on the best available data.
- *Related Hazards:* Flooding; Landslide, debris flow, rockfall, earthquake

Table 4-14 Dam and Reservoir Failure Risk Summary

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Hinsdale County	Limited	Likely	Limited	Medium
Lake City	Limited	Unlikely	Negligible	Low

4.3.3 Drought

Hazard/Problem Description

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends.

Drought is a complex issue involving 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 defined by a period of substantially diminished precipitation duration and/or intensity. The commonly used definition of meteorological drought is an interval of time, generally on the order of months or years, during which the actual moisture supply at a given place consistently falls below the climatically appropriate moisture supply.
- **Agricultural** drought occurs when there is inadequate soil moisture to meet the needs of a particular crop at a particular time. Agricultural drought usually occurs after or during meteorological drought, but before hydrological drought and can affect livestock and other dry-land agricultural operations.

- **Hydrological** drought refers to deficiencies in surface and subsurface water supplies. It is measured as stream flow, snow pack, and as lake, reservoir, and groundwater levels. There is usually a delay between lack of rain or snow and less measurable water in streams, lakes, and reservoirs. Therefore, hydrological measurements tend to lag behind other drought indicators.
- **Socio-economic** drought occurs when physical water shortages start to affect the health, well-being, and quality of life of the people, or when the drought starts to affect the supply and demand of an economic product.

Due to Colorado's semiarid conditions, drought is a natural but unpredictable occurrence in the state. However, because of natural variations in climate and precipitation sources, it is rare for all of Colorado to be deficient in moisture at the same time. Single season droughts over some portion of the state are quite common.

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

The onset of drought in western Colorado mountainous counties is usually signaled by a lack of significant winter snowfall. Hot and dry conditions that persist into spring, summer, and fall can aggravate drought conditions, making the effects of drought more pronounced as water demands increase during the growing season and summer months.

Location

Drought is a regional hazard, and at its worst can affect the entire state of Colorado with varying levels of dryness and drought activity (as will be covered in more detail under the sections to follow). It is safe to assume that unless the drought event is at its very beginning or very end, if any area of the Hinsdale County is affected by any level of drought, the other areas of the county are experiencing varying effects as well. Therefore, the geographical area affected by drought in Hinsdale County is **extensive**.

Extent (Magnitude/Severity)

The U.S. Drought Monitor is an accepted and widely used site for obtaining and summarizing drought information, as it integrates data from several other sources including the Palmer Drought Index, Soil Moisture Models, U.S. Geological Survey Weekly Stream Flows, Standardized Precipitation Index, and the Satellite Vegetation Health Index. It includes drought intensity categories for measuring dry conditions across counties, states, and regions of the U.S., so that drought can be quantified. These categories range from "abnormally dry" to "exceptional drought." The following figures provide "snapshots in time" of the drought conditions in Colorado as of April 2018, April 2019, and July 2019 (most recent snapshot of the state). The snapshots selected are instrumental in depicting both the historic and potential change in drought's geographic range and severity in the County (circled in black).



Note: The Drought Monitor maps integrate data from several sources including the Palmer Drought Index, Soil Moisture Models, U.S. Geological Survey Weekly Stream flows, Standardized Precipitation Index, and Satellite Vegetation Health Index.

Figure 4-12 U.S. Drought Monitor for Colorado: April 24, 2018

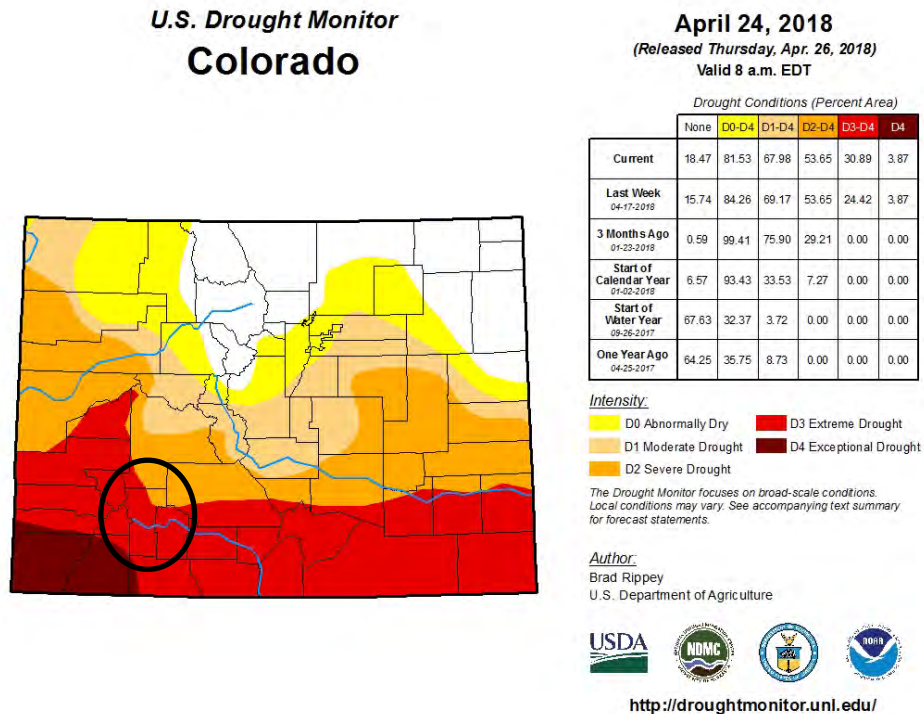


Figure 4-13 U.S. Drought Monitor for Colorado: April 30, 2019

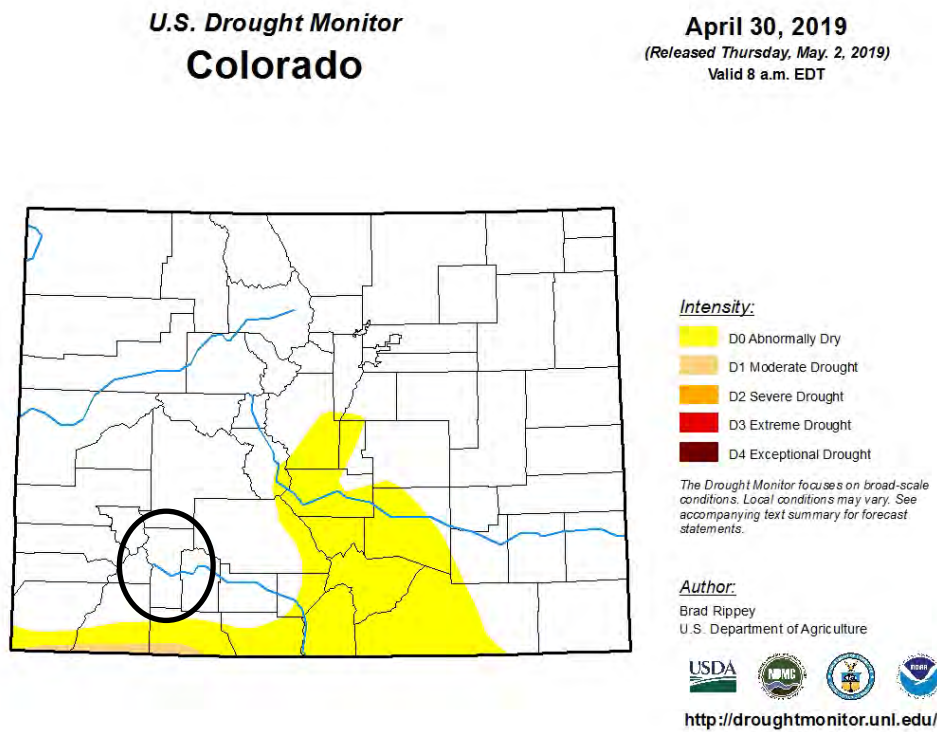
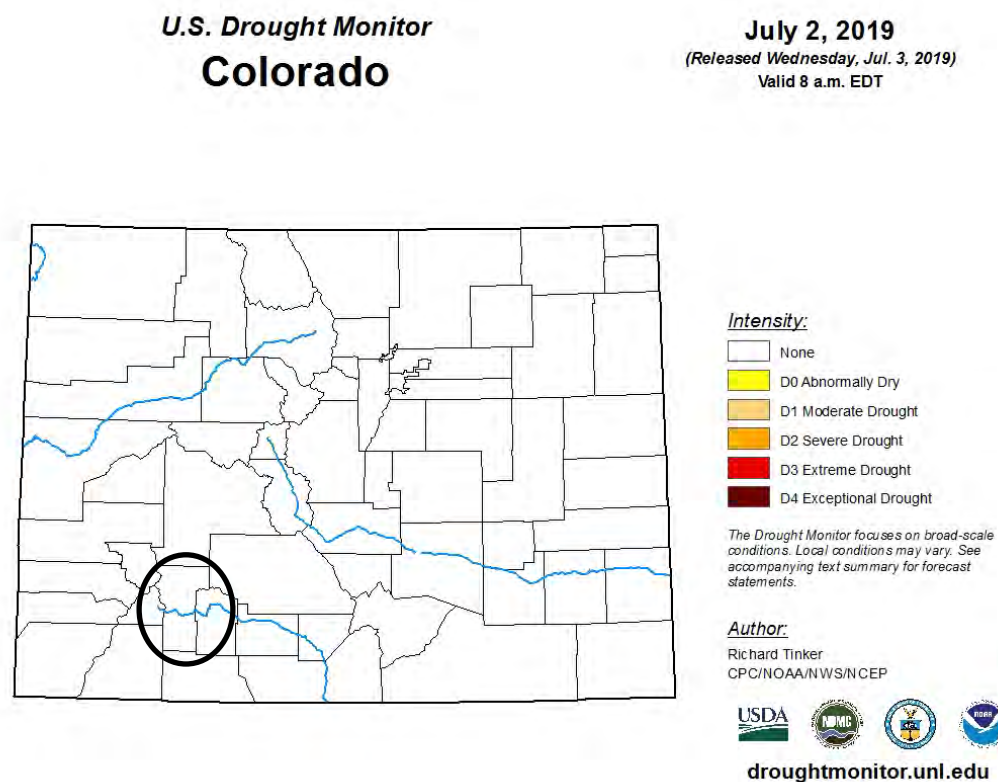


Figure 4-14 U.S. Drought Monitor for Colorado: July 2, 2019



Overall, extent of drought impacts, or magnitude/severity of impacts are critical for the County. The magnitude of a drought's impact will be directly related to the severity and length of the drought. Secondary effects include increased susceptibility to wildland fires and pine beetle infestations. Fire restrictions in the County and on Public Lands impact agriculture, construction, and outdoor recreation with economic consequences.

Previous Occurrences

Colorado has experienced drought in 2011-2013, 2000-2006, 1996, 1994, 1990, 1989, 1979-1975, 1965-1963, 1957-1951, 1941-1931, and 1905-1893 (Colorado Drought Mitigation and Response Plan, 2018). The most significant are listed in Table 4-15. Although drought conditions can vary across the state, it is likely that Hinsdale County suffered during these dry periods.

Table 4-15 Historical Dry and Wet Periods in Colorado

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

Source: McKee, et al. 1999

*modified for 2018 State of Colorado Drought Mitigation and Response Plan Update based on input from the Colorado Climate Center

Southwestern Colorado and Hinsdale County were impacted by the multi-year drought that began in 1997 and continued into 2004. The summer of 2002 was particularly severe and negatively affected local agriculture and irrigation. The wildland fires that burned that summer had a negative impact on the air quality in the region. Additionally, 2012 and 2013 brought drought conditions throughout the state, and information based on the U.S. Drought Monitor indicates that approximately 50% of Colorado was already under drought conditions by the beginning of 2012. By the end of May 2012, minimal snow accumulation and above average temperatures lead to a statewide drought and streamflows measured only slightly better compared to the extreme drought years of 1934, 1954, 1977 and 2002 (Ryan and Doesken, 2013).

Figure 4-12, Figure 4-13 and Figure 4-14 above compare the severity of the drought in southwest Colorado in April 2018 with the severity of the drought in April 2019 and then current conditions. The



maps illustrate significantly improved conditions in Hinsdale County from extreme drought conditions across the entire planning area in April 2018 to virtually no drought conditions a year later in April 2019.

There has been one Federal disaster declaration related to drought for Hinsdale County, EM-77026 declared January 29, 1977. There have been several (12) USDA Secretarial Disaster Declarations for the County in the last 16 years. The following table summarizes the USDA Disaster Declarations related to drought from 2003 to 2019, in which Hinsdale County was included.

Table 4-16 Summary of USDA Secretarial Disaster Declarations for Hinsdale County, 2003-2019

Year	Type	Declaration Number
2003	Drought, Insects	S1843
2005-2006	Drought, Fire, High Winds, Heat	S2327
2011	Drought	S3144
2012	Drought, Wind/High Winds, Heat/Excessive Heat	S3260
2013	Drought, Wind/High Winds, Fire/Wildfire, Heat/Excessive Heat, Insects	S3545
		S3539
		S3548
2014	Drought, Wind/High Winds, Fire/Wildfire, Heat/Excessive Heat, Insects	S3715
2018	Drought	S4320
		S4329
		S4347
2019	Drought	S4481

Source: 2018 State of Colorado Drought Mitigation and Response Plan Update, USDA Secretarial Disaster Declarations, 2019,

The Storm Events Database from the National Centers for Environmental Information (NCEI) lists all the drought events for the County. According to the Database there have been 224 events between 1950 and 2018 that have impacted Hinsdale County. However, there are no identified associated economic losses (property damage or crop damage).

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 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 20 drought impacts from droughts that affected Hinsdale County between 1999 and July 2019, refer to Figure 4-15 below. The list is not comprehensive. Most of the impacts were classified as "relief, response & restrictions" (9) and "agriculture" (8). Other impacts include "tourism & recreation" (5), "plants & wildlife" (5), "water supply & quality" (3), "fire" (2), "society & public health" (2) and "business & industry" (1). These categories are described as follows:

- **Agriculture**—Impacts associated with agriculture, farming, and ranching. Examples 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, reduced productivity of rangeland, forced reduction of foundation stock,

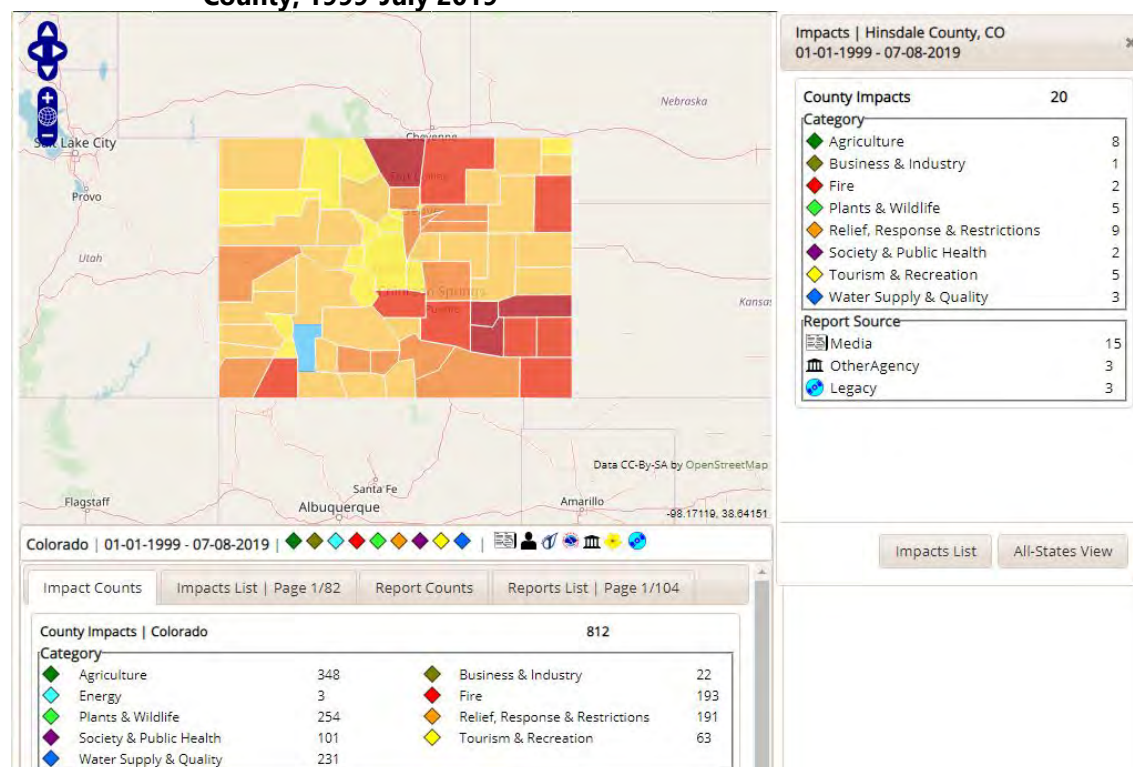


closure/limitation of public lands to grazing, high cost/unavailability of water for livestock, and range fires.

- **Water/Energy**—Impacts associated with surface or subsurface water supplies (i.e., reservoirs or aquifers), stream levels or streamflow, hydropower generation, or navigation. Examples include lower water levels in reservoirs, lakes, and ponds; reduced flow from springs; reduced streamflow; loss of wetlands; estuarine impacts; increased groundwater depletion, land subsidence, reduced recharge; water quality effects; revenue shortfalls and/or windfall profits; cost of water transport or transfer; cost of new or supplemental water resource development; and loss from impaired navigability of streams, rivers, and canals.
- **Plants and Wildlife**—Impacts associated with wildlife, fisheries, forests, and other fauna. Examples include loss of biodiversity of plants or wildlife; loss of trees from urban landscapes, shelterbelts, 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; migration and concentration; and increased stress to endangered species.
- **Fire**—Impacts associated with wildland fires that occur during drought events. The relationship between fires and droughts is very complex. Not all fires are caused by droughts and serious fires can result when droughts are not taking place.
- **Social**—Impacts associated with the public, or the recreation/tourism sector. Examples include health-related low-flow problems (e.g., cross-connection contamination, diminished sewage flows, increased pollutant concentrations, reduced firefighting capability, etc.), loss of human life (e.g., from heat stress, suicides), public safety from wildland fires, increased respiratory ailments; increased disease caused by wildlife concentrations, population migrations, loss of aesthetic values; reduction or modification of recreational activities, losses to manufacturers and sellers of recreational equipment, and losses related to curtailed activities.
- **Other**—Drought impacts that do not easily fit into any of the above categories.



Figure 4-15 Drought Impact Reporter Summary of Impacts at the County Level in Hinsdale County, 1999-July 2019



Source: National Drought Mitigation Center - Drought Impact Reporter, 2019

Beyond the impacts addressed by the Drought Monitor, Hinsdale County also experienced significant impacts for recreation and tourism. Drought affects the economy by impacting tourism due to the threat of wildfire and the impacts on local ranchers. The County has a history of prolonged dry weather periods that have significant economic and environmental impacts. Vegetation is stressed, vegetative diversity may be altered, and wildfires thrive during drought cycles. Farmers and ranchers are hard pressed to grow crops and feed livestock through drought years and show a profit. Tourism is adversely affected as well during drought cycles, particularly with the threat of wildfire. The areas vulnerability to drought is well documented and discussed further in the **Vulnerability** section below.

During the planning process the HMPC noted the following impacts of drought that have been experienced in past:

Recreation impacts have been significant

Campfire bans have been enacted

Lake City enacted voluntary water restrictions during 2018 drought

Water cannot be used for road maintenance and dust control purposes when creeks are running low

Probability of Future Occurrences

Likely — Between 10 and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less. Historical drought data for the planning area indicates there has been 12 USDA Secretarial Disaster Declarations due to Drought for the County in the past 16 years. This equates to a 75 percent chance of a drought in any given year, which corresponds to a likely occurrence rating. In addition,

although drought affects the entire planning equally, the potential impacts may be variable depending on contextual factors such as the degree of assets and activities historically impacted by drought, such as the agricultural and tourism industries.

Climate Change Considerations

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

Table 4-17 Future Drought Vulnerability Due to Climate Change and Challenges Faced by Colorado Water Managers

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



Challenge	Observed and/or Projected Change
Groundwater resources	Changes in long-term precipitation and soil moisture can affect groundwater recharge rates; coupled with demand issues, this may mean greater pressure on groundwater resources.

Source: State of Colorado Drought Mitigation and Response Plan 2018, Reproduced from CWCB, 2008

Vulnerability

The historical and potential impacts of drought on property include crop loss, injury and death of livestock and pets, and damage to infrastructure and other buildings resulting from the secondary or cascading drought impacts such as land subsidence, soil erosion, and flash flooding. As a related drought impact, tree mortality has resulted in potentially vulnerable critical infrastructure property as these trees become more susceptible to falling with time and could affect properties in the county. According to the State of Colorado Drought Mitigation and Response Plan (2018), drought is mostly likely to impact the socioeconomic sector of the County; this include secondary economic impacts, behavioral health impacts and public health concerns specific to drought. The County's drought specific vulnerability is discussed further below.

General Property

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

People

The historical and potential impacts of drought on populations include agricultural sector job loss, secondary economic losses to local businesses and public recreational resources, increased cost to local and state government for large-scale water acquisition and delivery, and water rationing and water wells running dry for individuals and families. As drought is often accompanied by prolonged periods of extreme heat, negative health impacts such as dehydration can also occur, where children and elderly are most susceptible. Other public health issues can include impaired drinking water quality, increased incidence of mosquito-borne illness, an increase in wildlife-human confrontations and respiratory complications as a result of declined air quality in times of drought.

Critical Facilities

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

Economy

The County's diverse natural environment makes it a destination for tourists to visit but the County's reliance on tourism and the recreation sector as the main economic base make it particularly vulnerable to the effects of drought. Wildlife viewing, hunting and fishing activities have been impacted in past drought events by lower production and requirement numbers and by animals moving away from traditional viewing and hunting areas due to lack of water, loss of vegetative cover, decreased streamflows, sedimentation and fish decline. Drought also has an impact on camping due to forced closures of campsites and surrounding forest due to wildfires and risk of wildfire and hazardous trees are all exacerbated by drought. Drought impacts on the County's natural environment and the cascading

impacts to the recreation sector could lead to less people visiting and spending money in County which could have a negative impact on the entire local economy.

Historic, Cultural, and Natural Resources

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

Future Development

Losses associated with drought and future development are not anticipated to be substantial unless there is more agricultural and housing development.

Risk Summary

- *Effects on people:* Potential for recreation and tourism sector job loss. An increased risk of public health issues such as impaired drinking water, increased incidence of mosquito-borne illness, an increase in wildlife-human confrontations and respiratory complications as a result of declined air quality.
- *Effects on property:* limited
- *Effects on economy:* Reduced tourism due to wildfires or camping/hunting/fishing restrictions
- *Effects on critical facilities and infrastructure:* Biggest impact on water-supply and distribution, as well as critical facilities dependent on steady water supply.
- *Related Hazards:* Wildfire

Table 4-18 Hazard Risk Summary

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Hinsdale County	Extensive	Likely	Critical	High
Town of Lake City	Extensive	Likely	Critical	High

4.3.4 Earthquake

Hazard/Problem Definition

An **earthquake** is a sudden, rapid shaking of the ground caused by the breaking and shifting of rock beneath the earth's surface or along fault lines. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet, commonly called faults; however, some earthquakes occur in the middle of plates.

A **fault** is a fracture in the earth's crust along which movement has occurred either suddenly during earthquakes or slowly during a process called creep. Cumulative displacement may be tens or even hundreds of miles if movement occurs over geologic time. However, individual episodes are generally small, usually less than several feet, and are commonly separated by tens, hundreds, or thousands of years. Damage associated with fault-related ground rupture is normally confined to a fairly narrow band along the trend of the fault. Structures are often not able to withstand fault rupture and utilities crossing faults are at risk of damage. Fault displacement involves forces so great that it is generally not feasible (structurally or economically) to design and build structures to accommodate this rapid displacement.

Fault displacement can also occur in the form of barely perceptible movement called "fault creep." Damage by fault creep is usually expressed by the rupture or bending of buildings, fences, railroads, streets, pipelines, curbs, and other linear features. In addition, there is also the potential for co-seismic creep, where movement on a fault is triggered by an earthquake on another nearby fault.

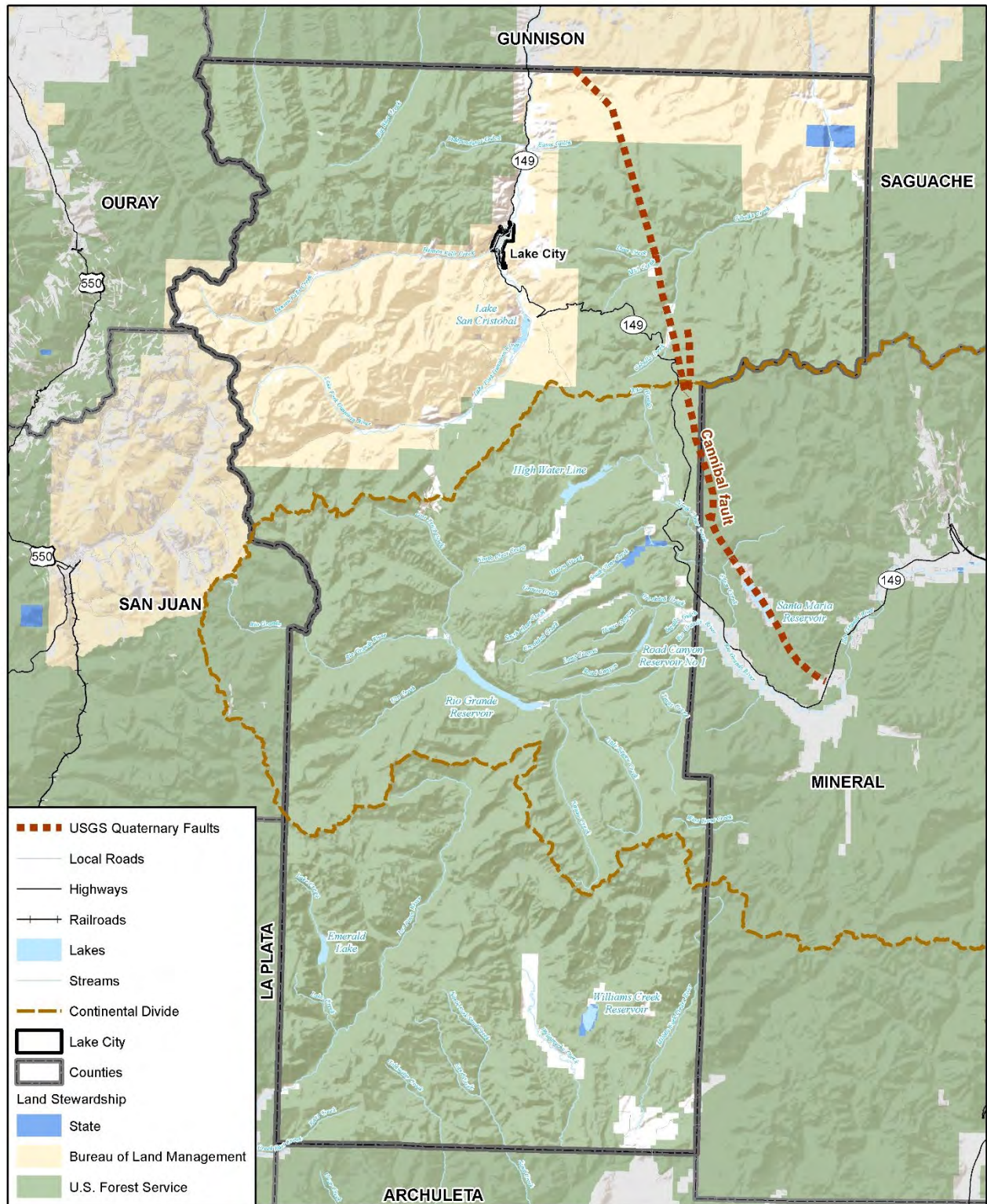
Liquefaction occurs when ground shaking causes the mechanical properties of some fine grained, saturated soils to *liquefy* and act as a fluid (liquefaction). It is the result of a sudden loss of soil strength due to a rapid increase in soil pore water pressures caused by ground shaking. In order for liquefaction to occur, three general geotechnical characteristics should be present: 1) ground water should be present within the potentially liquefiable zone, 2) the potentially liquefiable zone should be granular and meet a specific range in grain-size distribution, and 3) the potentially liquefiable zone should be of low relative density. If those criteria are present and strong ground motion occurs, then those soils could liquefy, depending upon the intensity and duration of the strong ground motion. Liquefaction that produces surface effects generally occurs in the upper 40 to 50 feet of the soil column, although the phenomenon can occur deeper than 100 feet. The duration of ground shaking is also an important factor in causing liquefaction to occur. The larger the earthquake magnitude, and the longer the duration of strong ground shaking, the greater the potential there is for liquefaction to occur.

Geographic Area

The only USGS-identified Quaternary earthquake fault in the County is shown below in Figure 4-16. The Cannibal fault runs in a north-south trend from the central-north of the county towards the central-east of the county, exiting the county into Mineral County closely following North Clear Creek and Clear Creek through the Santa Maria Reservoir.



Figure 4-16 The Cannibal Earthquake Fault Line in Hinsdale County

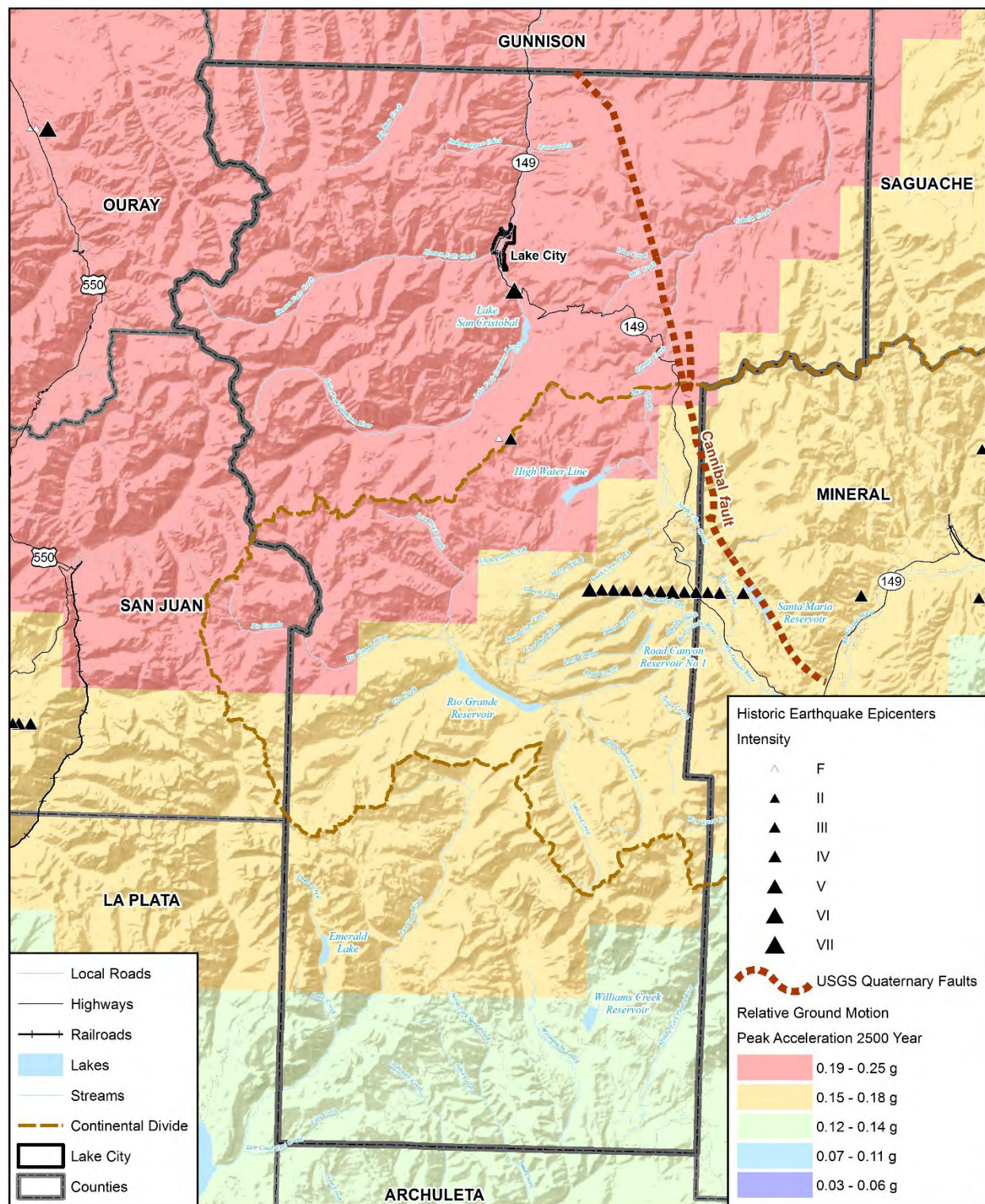


wood.

Map compiled 5/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, USGS, CO BLM

Figure 4-17 displays an earthquake shaking map of the county that is based on the 2% probability of occurrence in 50 years, based on analyses of these faults, soils, topography, groundwater, and the potential for earthquake shaking sufficiently strong to trigger landslide and liquefaction. It represents worst-case ground shaking and supports the conclusion that Hinsdale County planning area is at risk to future damaging earthquake hazards, especially in the central and northern portions of the County. The highest relative ground accelerations could range from 0.19 g (19% g) to 0.25 g (25% g) in the next 50 years, where 'g' is the gravitational acceleration of the ground motion.

Figure 4-17 Ground Shaking Potential from Peak Acceleration the Planning Area



Map compiled 5/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, USGS, CGS

Extent (Magnitude/Severity)

For extent, the severity of an earthquake, or the amount of energy released during an earthquake is usually expressed in terms of intensity or magnitude as described further below.

Intensity: Intensity represents the observed effects of ground shaking at any specified location and earthquake shaking decreases with distance from the earthquake epicenter, the point on the earth's surface where a seismic rupture begins. Intensity is an expression of the amount of shaking at any given location on the ground surface based on felt or observed effects. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. Intensity is measured with the Modified Mercalli Intensity (MMI) scale. The intensity of ground shaking at a particular site or structure is a function of many factors including: 1) earthquake magnitude, 2) distance from the epicenter, 3) duration of strong ground motion, 4) local geologic conditions (soil type and topography), and 5) the fundamental period of the structure. A brief description of those factors is presented below. The Modified Mercalli Intensity scale is summarized in Table 4-19, along with the effects associated with the MMI scale. Damage typically occurs in MMI of scale VII or above.

Earthquake Magnitude: Magnitude represents the amount of seismic energy released at the hypocenter, the point within the earth where an earthquake rupture starts, of an earthquake. It is based on the amplitude of the earthquake waves recorded. Seismologists have developed several magnitude scales; one of the first was the Richter Scale, developed in 1932 by the late Dr. Charles F. Richter of the California Institute of Technology. The Richter scale is numeric and has a logarithmic relationship between scale factors, so that a difference of one scale number represents a tenfold increase in measured amplitude, which in turn corresponds to an approximate 31x energy release difference when compared to the next whole number value. The Moment Magnitude scale (M_w , or M), which is a measurement of energy released by the movement of a fault and is the modern method used by seismologists to measure earthquakes. Overall, as the amount of energy released by an earthquake increases, the potential for ground shaking impacts also increases.

Distance from Epicenter: Earthquake energy generally dissipates (or attenuates) with distance from a fault. Over long distances, this loss of energy can be significant, resulting in a significant decrease in ground shaking with increased distance from the epicenter.

Duration of Strong Shaking: The duration of the strong ground shaking constitutes a major role in determining the amount of structural damage and the potential for ground failure that can result from an earthquake. Larger magnitude earthquakes have longer durations than smaller earthquakes.

Local Geologic Conditions: The geologic and soil conditions at a particular site have the potential to substantially increase the effects of ground shaking. The thickness, density, and consistency of the soil, as well as shallow ground water levels, have the potential to amplify the effects of ground shaking depending on the characteristics of the earthquake. In general, the presence of unconsolidated soils above the bedrock surface can amplify the ground shaking caused by an earthquake.

Fundamental Periods: Every structure has its own fundamental period or natural vibration. If the vibration of ground shaking coincides with the natural vibration period of a structure, damage to the structure can be greatly increased. The extent of damage suffered during an earthquake can also depend on non-geologic factors. The type of building and its structural integrity will influence the severity of the damage suffered. Generally, small, well-constructed, one- and two-story wood and steel frame buildings



have performed well in earthquakes because of their light weight and flexibility. Reinforced concrete structures will also usually perform well. Buildings constructed from non-flexible materials, such as unreinforced brick and concrete, hollow concrete block, clay tile, or adobe, are more vulnerable to earthquake damage.

Effects of Ground Shaking: The primary effect of ground shaking is the damage or destruction of buildings, infrastructure, and possible injury or loss of life. Building damage can range from minor cracking of plaster to total collapse. Disruption of infrastructure facilities can include damage to utilities, pipelines, roads, and bridges. Ruptured gas and water lines can result in fire and produce scour/inundation damage, respectively, to structures, as can fire from other causes, such as electrical damages. Secondary effects can include geologic impacts such as co-seismic fault movement along nearby faults, seismically induced slope instability, liquefaction, lateral spreading, and other forms of ground failure and seismic response.

Other Secondary or Compound Effects of Earthquakes: Fires can often take place after an earthquake, due to breaking electrical and gas lines which send sparks everywhere. Because of breaking pipelines and other utilities or infrastructure, in addition, compromised or broken water lines can further complicate the issue of fires arising from ground shaking activity, as the lack of water can lead to the inability to properly fight or extinguish fires. Fires and lack of water/other critical resources to combat impacts following earthquake activity are therefore often compounding in nature, though additional impacts often include closures of roads (affecting transportation of goods and people) and electricity and power outages.

Table 4-19 Earthquake Magnitude, Intensity Measurements, and Associated Characteristics

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

Source: USGS



Previous Occurrences

Where earthquakes have struck before, they will likely strike again. Historically active faults are generally thought to present the greatest risk for future movement and, therefore, have the greatest potential to result in fault rupture hazards.

The areas of Hinsdale County most susceptible to the effects of liquefaction are those areas underlain by young, poorly consolidated, saturated granular alluvial sediments. These soil conditions are most frequently found in areas underlain by recent river and flood plain deposits. No specific mapping of this hazard exists, but anticipated hazard areas are likely to be minimal due to the geology and geography of the County.

Following are historic earthquakes that were noted in or near Hinsdale County. Overall, it is estimated that \$2.98 million dollars have been lost from earthquake related impacts in the county:

1955 Lake City Earthquake. A Level VI Intensity earthquake was recoded in Lake City in 1955 around August 3rd and possibly caused movement on the Slumgullion Earthflow.

1960 Earthquake. A magnitude 5.5 quake took place about 35.7 miles from the planning area, though the depth is not known.

1980s Near Ridgway. Another earthquake took place in the 1980s that was felt by Lake City residents, with the quake's epicenter near Ridgway in nearby Ouray County.

Probability of Future Occurrences

Occasional – It is estimated that earthquakes or fault movement activity in or near the county has a 1 to 10 percent chance of occurring in the next year, which equates to a recurrence interval of once in the next 10 to 100 years.

Climate Change Considerations

While climate change is not expected to directly affect earthquake frequency or intensity, it could exacerbate indirect or secondary impacts of earthquakes. For example, climate change could increase the frequency and intensity of extreme precipitation events, in turn increasing the probability of landslides and liquefaction events during an earthquake if the earthquake coincided with a wet cycle.

Vulnerability to Earthquake

Earthquake loss estimation for the 2019 HMP update utilized FEMA's Hazus 4.2 natural hazard loss estimation software. Hazus is a GIS based, standardized, nationally applicable multi-hazard loss estimation methodology and software. Local, state and federal government officials use Hazus for preparedness, emergency response, and mitigation planning. A level 1 Hazus analysis was performed which estimates damage based on an inventory database compiled at a national level aggregated to Census Tracts. As with any model there are uncertainties and the results should be considered approximate for planning purposes.

To evaluate potential losses associated with earthquake activity in the planning area, a Hazus 2,500-year probabilistic scenario was run for the entire Hinsdale County. The 2,500-year scenario represents a worst-case level of shaking that considers multiple faults in the region and is not tied to a specific magnitude event. The methodology utilizes probabilistic seismic hazard contour maps developed by the U.S. Geological Survey (USGS). The 2,500-year return period analyzes ground shaking estimates from the

various seismic sources in the area with a 2 percent probability of being exceeded in 50 years. The International Building Code uses this level of ground shaking for building design in seismic areas.

Hazus estimates the number of people displaced, the number of buildings and facilities/infrastructure damaged, the number of casualties, and the damage to transportation systems and utilities. Results produced by Hazus are reported by at the census tract level. Hinsdale County only has one single census tract (tract number 08053973100) which includes the Town of Lake City, as such summaries will be explained for the county as a whole.

General Property

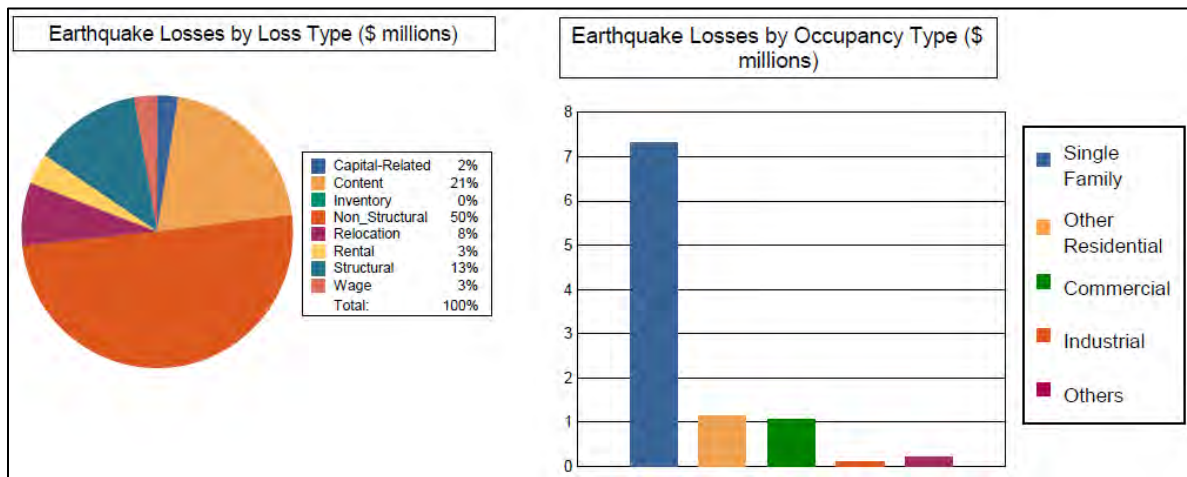
Unreinforced Masonry Building (URM)s: Unreinforced masonry building type structures consist of buildings made of unreinforced concrete and brick, hollow concrete blocks, clay tiles, and adobe. Buildings constructed of these materials are heavy and brittle, and typically provide little earthquake resistance. In small earthquakes, unreinforced buildings can crack, and in strong earthquakes, they have a tendency to collapse. These types of structures pose the greatest structural risk to life and safety of all general building types. Non-structural items and building components can also influence the amount of damage that buildings suffer during an earthquake. Unreinforced parapets, chimneys, facades, signs, and building appendages can all be shaken loose, creating a serious risk to life and property. Given the number of historic buildings in Lake City it is expected that some of these are unreinforced masonry buildings and susceptible to earthquake damage.

Hazus Results: There are an estimated 1,000 buildings in the region with a total building replacement value (excluding contents) of \$375 million. In terms of building construction types found in the region, wood frame construction makes up 66% of the building inventory.

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake.

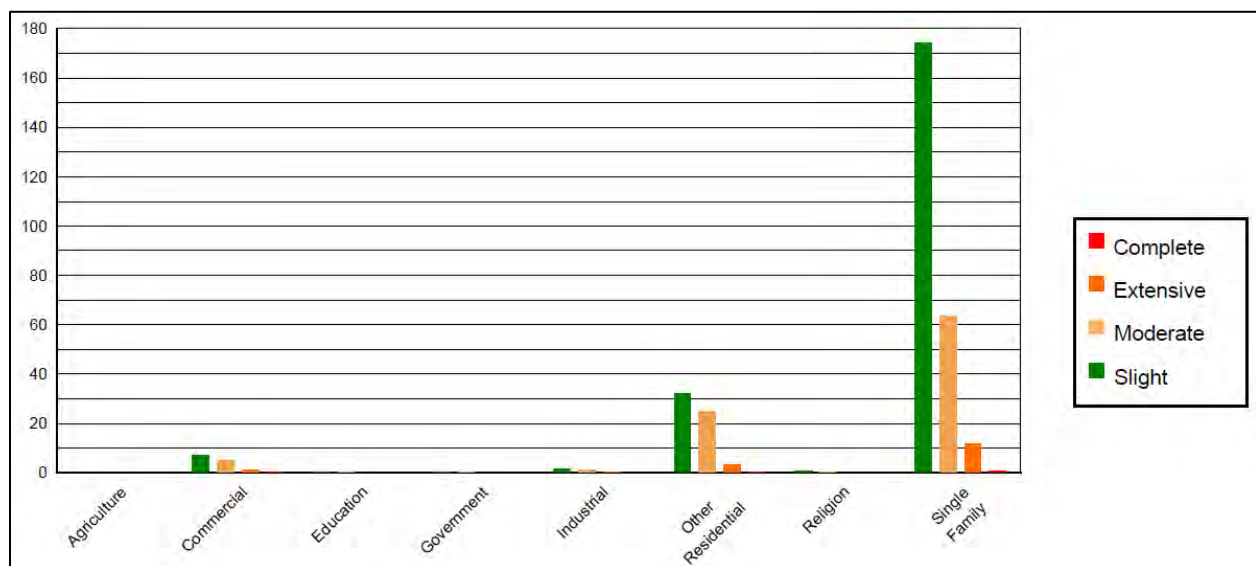
Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake. The total building-related losses were \$9.83 million. By far, the largest loss was sustained by the residential occupancies which made up over 86% of the total loss. The figure and table below provide a summary of the losses associated with the building damage.

Figure 4-18 Earthquake Losses by Loss Type and Occupancy Type (in Millions of Dollars)



Source: Hazus 4.2

Figure 4-19 Hazus 2,500 Probabilistic Earthquake Scenario Structure Damage by Occupancy Type



Source: Hazus 4.2

Hazus estimates that about 112 buildings will be at least moderately damaged. This is over 8% of the total number of buildings in the region. There are 0 buildings that will be damaged beyond repair. Table 4-20 summarizes the expected damage by property occupancy type in more detail, whereas Table 4-21 contains the results of the expected building damage by building material type.

Table 4-20 Expected Building Damage by Occupancy Class

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	33.23	3.01	6.87	3.18	4.66	4.91	1.16	7.09	0.08	8.80
Education	1.49	0.14	0.28	0.13	0.18	0.19	0.04	0.25	0.00	0.27
Government	1.46	0.13	0.29	0.14	0.20	0.21	0.04	0.26	0.00	0.28
Industrial	6.39	0.58	1.36	0.63	0.98	1.04	0.25	1.56	0.01	1.48
Other Residential	97.81	8.87	32.18	14.90	24.81	26.14	3.05	18.63	0.14	15.46
Religion	2.98	0.27	0.58	0.27	0.36	0.38	0.08	0.46	0.00	0.52
Single Family	959.44	87.00	174.41	80.76	63.71	67.13	11.76	71.76	0.68	73.19
Total	1,103		216		95		16		1	

Source: Hazus 4.2

Table 4-21 Expected Building Damage by Building Material (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	771.56	69.96	143.00	66.21	31.65	33.35	2.45	14.93	0.10	10.38
Steel	11.78	1.07	1.94	0.90	1.44	1.52	0.25	1.53	0.02	2.14
Concrete	10.36	0.94	2.33	1.08	1.48	1.56	0.24	1.48	0.01	0.93
Precast	6.41	0.58	1.38	0.64	1.53	1.61	0.56	3.41	0.02	2.33
RM	201.71	18.29	30.09	13.93	28.79	30.34	7.83	47.75	0.12	12.52
URM	24.18	2.19	9.11	4.22	7.00	7.37	2.37	14.44	0.54	59.01
MH	76.81	6.96	28.13	13.02	23.01	24.25	2.70	16.47	0.12	12.70
Total	1,103		216		95		16		1	

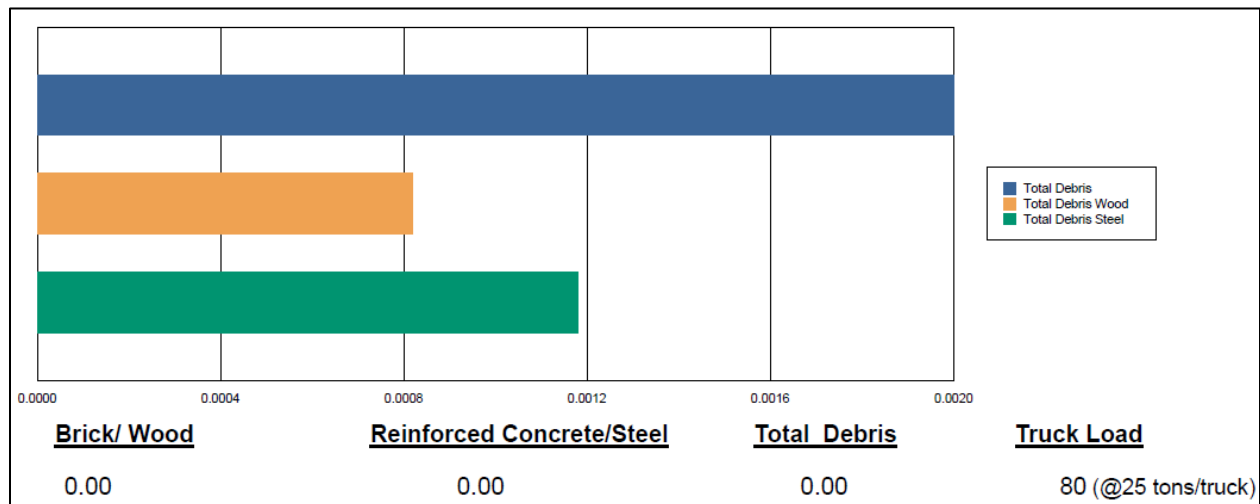
Source: Hazus 4.2

Note: RM – Reinforced Masonry
URM – Unreinforced Masonry
MH – Manufactured Housing

Hazus also estimates the amount of debris that will be generated by the earthquake event analyzed. The model subdivides the debris into two general categories: a) Brick/Wood; and, b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,000 tons of debris will be generated. Of that total amount, Brick/Wood comprises 41% of the debris, while the remainder would be Reinforced Concrete/Steel. If the debris tonnage was converted to estimates of truckloads required to remove it, debris generated would convert to about 80 truckloads, with each truckload carrying 25 tons. Figure 4-20 summarizes the debris generation and material type for this earthquake event.

Figure 4-20 Debris Generation in Millions of Tons and by Material Type



Source: Hazus 4.2

People

Shelter Requirement: Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates that no households will be displaced due to the earthquake, and no people will seek temporary shelter in public shelters.

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

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

The casualty estimates are provided for three times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is at its maximum. The 2:00 PM estimate considers that the educational, commercial and industrial sector loads are at their maximum. The 5:00 PM represents peak commute time. These estimates report that 0 casualties would be expected.

Critical Facilities and Infrastructure

Critical Facility Inventory: Hazus breaks critical facilities into two groups: essential facilities and high potential loss (HPL) facilities. Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites. Note that Hazus only provides

structure and facility estimates based on U.S. Census data from 2010, and so the mentioned inventory results are likely off based on today's actual facility totals.

Essential Facility Damage: The model did not result in expected damages from the earthquake event.

Transportation Systems Inventory: Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are 7 transportation systems that include highways, railways, light rail, bus, ports, ferry, and airports. There are 6 utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power, and communications. The transportation systems inventory and expected damages from the earthquake would be \$0 based on the analysis. The transportation systems inventory includes over 38.53 miles of highways, 21 bridges, and 1,430.40 miles of pipes, and related economic losses to these systems would be around \$2,000 (very minor).

Utility Lifeline Systems Inventory: The replacement value of the transportation and utility lifeline systems combined is estimated to be \$260 million. The expected utility system facility damages in terms of total structures or systems affected, along with the inventory of this dataset, are summarized in Table 4-22. Economic losses in millions of dollars are found in Table 4-23. Site specific expected utility system pipeline damages (including their inventory) are included in Table 4-24. The model did not predict potable water and electric power system performance limitations or damages.



Table 4-22 Expected Utility System Facility Inventory and Damages

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	23.0236
	Facilities	0	0.0000
	Pipelines	0	0.0000
	Subtotal		23.0236
Waste Water	Distribution Lines	NA	13.8141
	Facilities	0	0.0000
	Pipelines	0	0.0000
	Subtotal		13.8141
Natural Gas	Distribution Lines	NA	9.2094
	Facilities	0	0.0000
	Pipelines	0	0.0000
	Subtotal		9.2094
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
	Subtotal		0.0000
Electrical Power	Facilities	0	0.0000
	Subtotal		0.0000
Communication	Facilities	0	0.0000
	Subtotal		0.0000
		Total	46.00

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

Source: Hazus 4.2



Table 4-23 Utility System Economic Losses in Millions of Dollars

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	23.0236	0.0514	0.22
	Subtotal	23.0236	0.0514	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	13.8141	0.0258	0.19
	Subtotal	13.8141	0.0258	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	9.2094	0.0088	0.10
	Subtotal	9.2094	0.0088	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
Communication	Facilities	0.0000	0.0000	0.00
	Subtotal	0.0000	0.0000	
	Total	46.05	0.09	

Source: Hazus 4.2

Table 4-24 Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	715	11	3
Waste Water	429	6	1
Natural Gas	286	2	0
Oil	0	0	0

Source: Hazus 4.2



Economy

Hazus estimates the long-term economic impacts to the region. The model quantifies this information in terms of income and employment changes within the region. The total economic loss estimated for the earthquake is \$9.92 million, which includes building and lifeline related losses based on the region's available inventory. About 16% of the estimated losses were related to the business interruption of the region.

Since the building losses are broken into two categories (of direct building losses compared to business interruption losses), building related losses, which summarize estimates costs to fix or replace structures and damages to properties and their contents are discussed in more detail in the

General Property section of this chapter.

However, business interruption losses are summarized below. They included the temporary living expenses for people displaced from their homes because of the earthquake event. These business-related economic losses are summarized in Table 4-25.

Table 4-25 Business-Related Economic Loss Estimates in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0867	0.1790	0.0021	0.0060	0.2738
	Capital-Related	0.0000	0.0370	0.1942	0.0012	0.0019	0.2343
	Rental	0.1670	0.1173	0.0534	0.0007	0.0034	0.3418
	Relocation	0.5951	0.0573	0.0711	0.0053	0.0289	0.7577
	Subtotal	0.7621	0.2983	0.4977	0.0093	0.0402	1.6076
Capital Stock Losses							
	Structural	1.0061	0.1302	0.0830	0.0116	0.0257	1.2566
	Non_Structural	3.9530	0.5539	0.2968	0.0440	0.0874	4.9351
	Content	1.6016	0.1545	0.1788	0.0287	0.0554	2.0190
	Inventory	0.0000	0.0000	0.0041	0.0058	0.0000	0.0099
	Subtotal	6.5607	0.8386	0.5627	0.0901	0.1685	8.2206
	Total	7.32	1.14	1.06	0.10	0.21	9.83

Source: Hazus 4.2

Historic, Cultural, and Natural Resources

Earthquake effects on the environment, natural resources, and historic and cultural assets could be very destructive depending on the type of seismic activity experienced and secondary/cascading effects from an event (e.g. wildfire). The biggest impact would likely be on the older historic properties in Lake City such as wooden or unreinforced masonry buildings.

Future Development

Future development in the county is not anticipated to significantly affect vulnerability to earthquakes when designed according to modern building codes such as 2015 International Building Code guidelines. However, future development will result in a slight increase in exposure of the population, building stock, and related infrastructure to earthquakes.

Risk Summary

Hinsdale County is located in a region with a quaternary fault (the Cannibal Fault, which means that the fault has been recognized to move in the past 1,600,000 years during a portion of the Quaternary geologic epoch). In addition, there are other potentially active faults in areas of Colorado, near Hinsdale. The County has a history of smaller but damaging earthquakes, even in the last few decades.

The overall significance of earthquakes is Medium.

- A moderate earthquake occurring in or near Hinsdale County could result in injuries, property damage, agricultural and environmental damage, and disruption of normal government, community services and activities, and economic and business activity.
- The location of the epicenter as well as the time of day and season of the year would have a profound effect on the number of injuries as well as property damage and business/economic disruption.
- The hazard of earthquakes varies from place to place, dependent upon the regional and local geology.
- *Effects on people:* The Hazus 2,500-year probabilistic scenario modeling of worst-case ground shaking estimates 0 people will be hurt or killed during an event, and 0 will need relocation or shelter.
- *Effects on property:* The Hazus analysis estimates the total building-related losses will be around \$9.83 million, and 86% of those losses will come from residential occupancies being damaged.
- *Effects on economy:* An estimated 16% of losses computed by Hazus were related to the business interruption of the region. The total economic loss estimated for an earthquake based on the Hazus analysis is \$9.9 million.
- *Effects on critical facilities and infrastructure:* *Essential facility damage* (police, fire, school, medical) is predicted to be none. Transportation system and utility lifeline impacts would be higher, as bridges and highways would see few damages (around a few thousand dollars), while potable water, wastewater, natural gas, and oil system utilities would see more significant damages and losses (about \$46 million).
- *Cascading and Secondary Effects:* Earthquakes can cause many cascading effects such as fires, flooding, avalanches (in winter), hazardous materials spills, landslide and debris flows, dam failure, utility disruptions, and transportation emergencies. Ground shaking may cause seiches, the rhythmic sloshing of water in lakes.
- *Related hazards:* Landslides, Avalanche, Dam Failure.

Table 4-26 Risk Summary by Jurisdiction

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Hinsdale County	Extensive	Occasional	Critical	Medium
Lake City	Extensive	Occasional	Critical	Medium

4.3.5 Flooding

Hazard/Problem Definition

Floods involve inundation of normally dry land or other areas. These hazards are among the most frequent and costly natural disasters in terms of human hardship and economic loss and are usually



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

The area adjacent to a river or stream channel is the floodplain. Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage, the floodplain most often refers to the area that is inundated by the 100-year flood, the flood that has a one percent (1%) chance in any given year of being equaled or exceeded. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program (NFIP). The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. A 500-year flood event would be deeper and cover a greater area than a 100-year flood event. The potential for flooding can change and increase through various land use changes and changes to land surface, which can result in a change to the floodplain.

Hinsdale County is susceptible to the following flood events:

- Rain in a general storm system
- Stormwater drainage
- Rain in a localized intense thunderstorm
- Melting snow
- Rain on melting snow
- Ice Jams
- Flash Floods
- Dam failure
- Rain on fire damaged watersheds

A change in environmental conditions can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity but can also be created by other natural events such as wildland fires and avalanches. Wildland fires 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. Landslides and avalanches cause large amounts of debris to block channels and potentially form temporary dams that can create be susceptible to overtopping and result in outburst flooding.

Geographic Area

Hinsdale County is covered by mountainous terrain and is very steep in many areas. According to the latest developed Flood Insurance Study (FIS) report, completed in 1987 by FEMA, flooding risk is aggregated by the steep topography, particularly in tributary basins and at headwaters.

The County is located within three major river basins in Colorado: the Rio Grande River Basin, the Gunnison River Basin, and the San Juan/Dolores River Basin. Historically, the County’s areas falling within



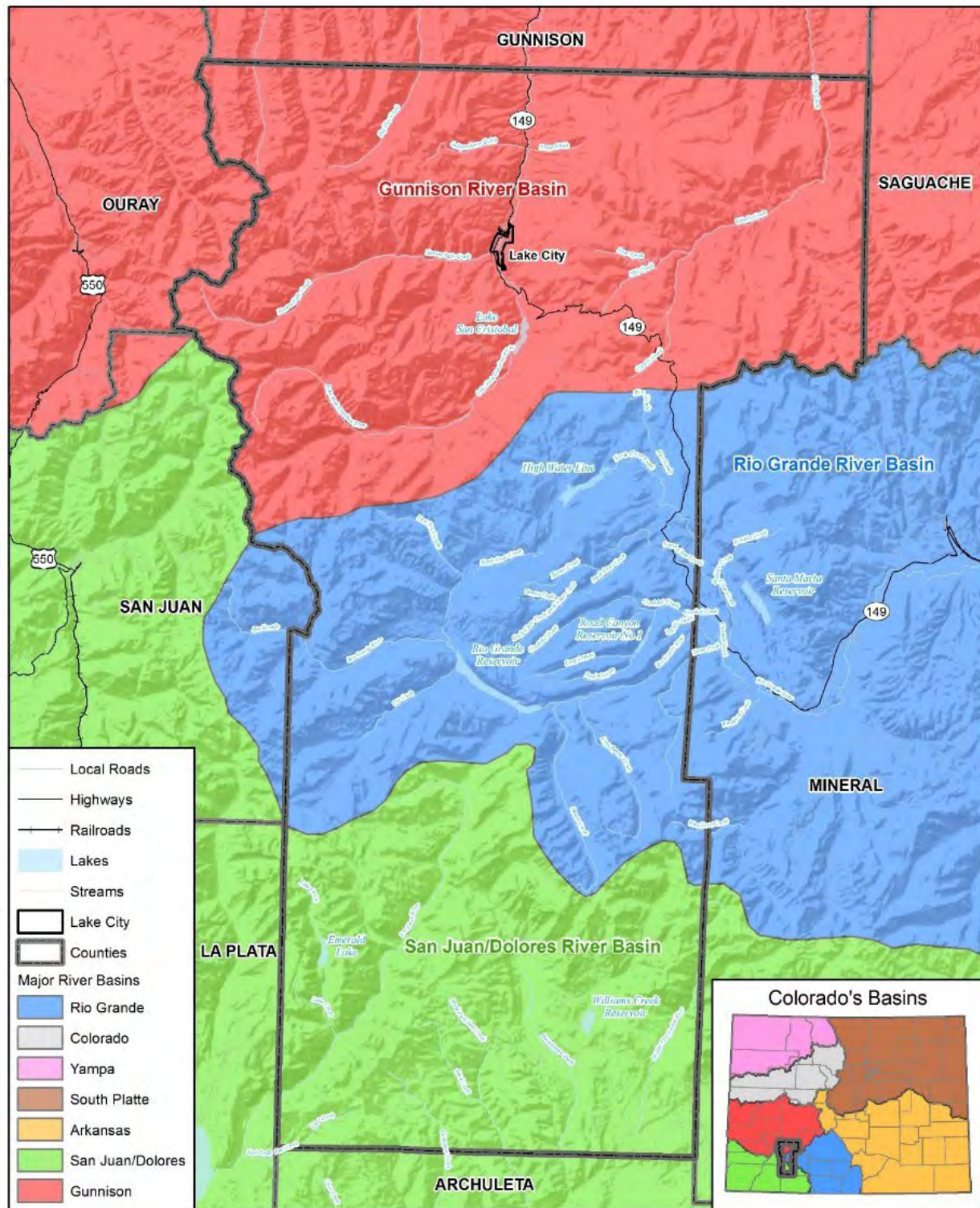
the Rio Grande and Gunnison River basins have seen significant flood hazards from the two major rivers draining onto these basins, particularly in the months of May and June when severe weather events and snowmelt are at their peak. Figure 4-21 below shows these river basins in the County.

Hinsdale County has over 332 miles of waterways. The major rivers crossing the county include the Rio Grande River, Lake Fork of Gunnison River, Henson Creek (also known as Hensen Falls Creek), Sand Creek, Middle Fork Piedra River, Los Pinos River, and Cebolla Creek along with several smaller streams (e.g. South Clear Creek, North Clear Creek, Little Squaw Creek, Trout Creek, Devils Creek, Cottonwood Creek, Big Spring Creek, Bear Creek, Crooked Creek, Lost Trail Creek, Texas Creek, Ute Creek, Weminuche Creek, Willow Creek, Rito Hondo, Big Blue Creek) and hundreds of additional miles of smaller streams and ditches.

Major water bodies in the County include: Emerald Lake in the county's southwest near the La Plata and San Juan Counties border; Williams Creek Reservoir on the southeast near the Mineral and Archuleta Counties border; the Rio Grande Reservoir in the middle of the county; the Road Canyon Reservoir Number 1 on the east, along the Long Canyon Creek (a tributary of the Rio Grande River) and near the Santa Maria Reservoir in Mineral County; High Water Line (also known as the Continental Reservoir) near the northwest corner of Mineral County; and, Lake San Cristobal just southeast of Lake City,



Figure 4-21 Major Colorado River Basins within Hinsdale County



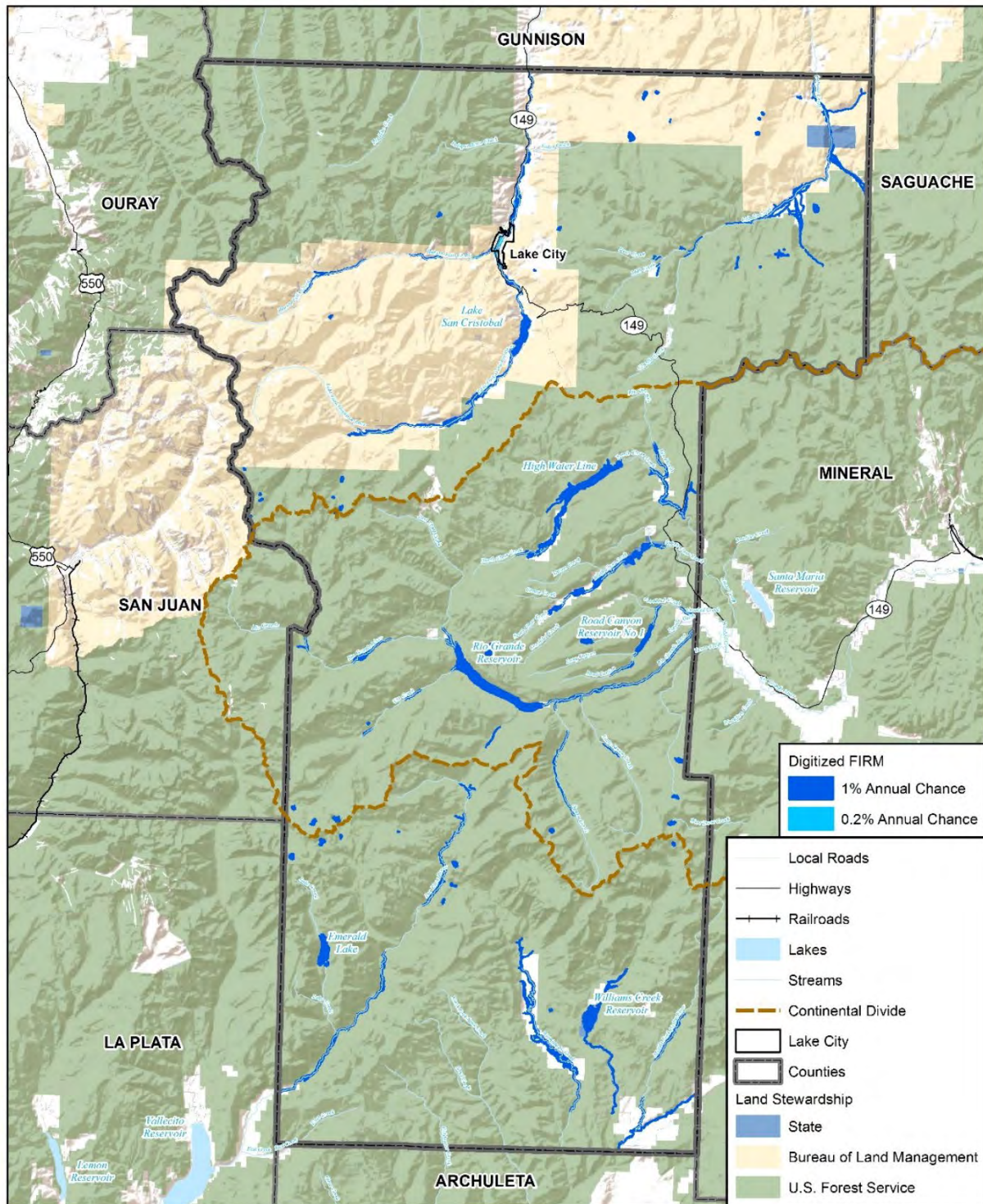
wood.
Map compiled 5/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, CO DWR

Major Sources of Flooding/Problem Areas

The major sources of flooding for Hinsdale County originate from the Lake Fork branch of the Gunnison River and the Henson Creek. Figure 4-22 on the following page displays FEMA-based special flood hazard areas as digitized from historic Flood Insurance Rate Map (FIRM) panels. Figure 4-23 shows the flood hazard areas in Lake City. A Community Flood Assessment for Hinsdale County was completed May 15, 2013 and identified the following problem areas or areas of concern:

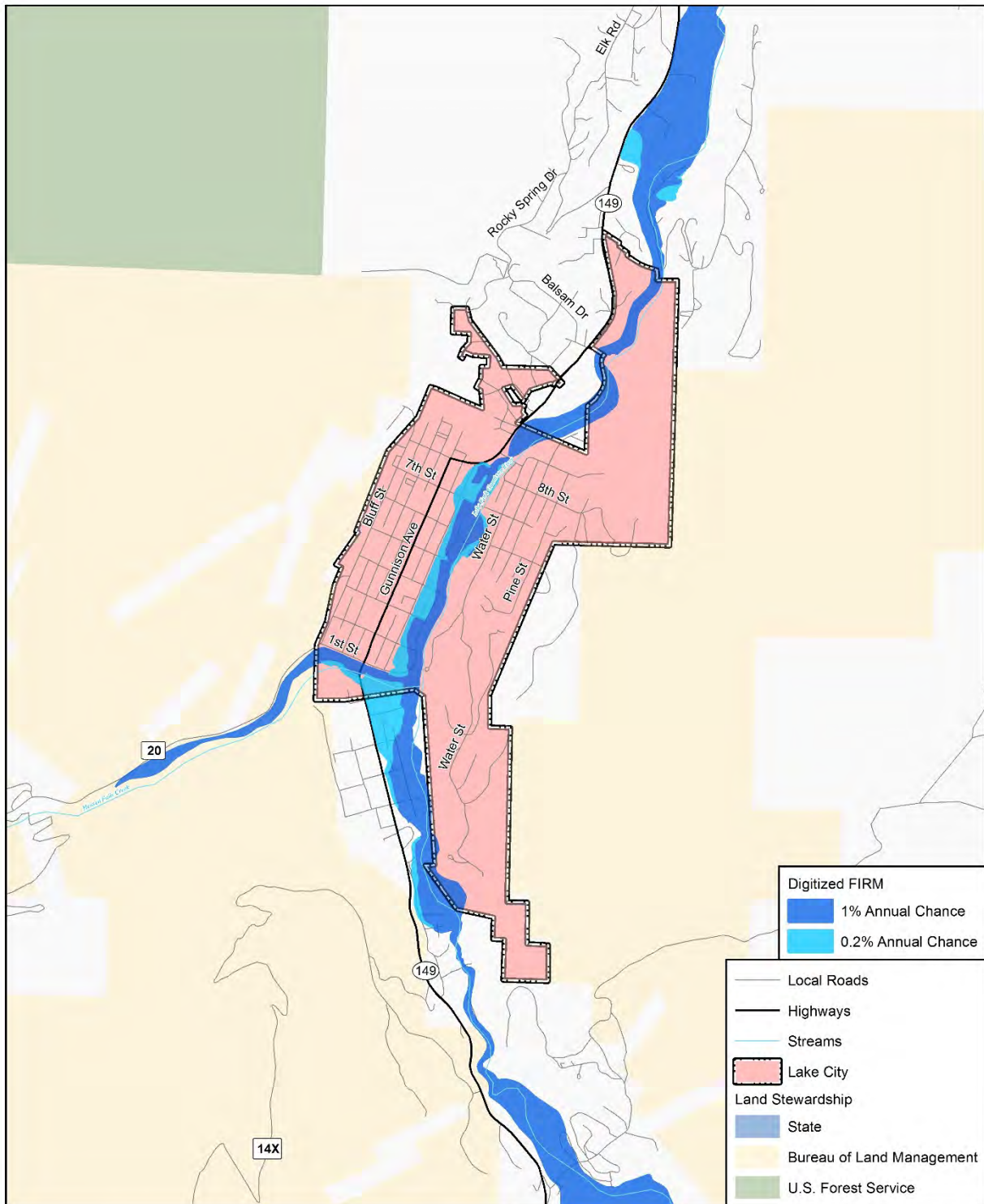
- All areas adjacent to Lake Fork including the ranching operations of Wade and Vickers Meadows
- Shelf Road
- Slumgullion Creek near where it goes into Lake San Cristobal – No Special Flood Hazard Area identified but the County has reported that the subdivision there is susceptible to flooding events given high sediment loads
- Areas north of Lake City to the County line
- Development near reservoirs southeast of Lake City
- Development near southeast corner near gauges
- Areas near Henson Creek near the confluence with the Lake Fork

Figure 4-22 Hinsdale County's FEMA Special Flood Hazard Areas



wood.
Map compiled 9/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, FEMA NFHL,
Wood Plc, CO BLM

Figure 4-23 Lake City's FEMA Special Flood Hazard Areas



wood.
Map compiled 5/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, CO BLM,
FEMA Digitized FIRM, Wood Plc

Floodplain Mapping

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

Flood Insurance Study (FIS)

The FIS includes flood hazard and mapping data that is used to establish flood insurance maps and rates and to assist the community in its efforts to promote sound floodplain management. The last developed FIS for Hinsdale County is dated September 30, 1987. This study covers both the unincorporated county areas and the Town of Lake City.

Flood Insurance Rate Map (FIRM)

The FIRM is designed for flood insurance and floodplain management applications. For flood insurance, the FIRM designates flood insurance rate zones to assign premium rates for flood insurance policies. For floodplain management, the FIRM delineates 100- and 500-year floodplains (or 1% annual chance floodplain and 0.2% annual chance floodplain, respectively), floodways, and the locations of selected cross sections used in hydraulic analyses.

Both 100- and 500-year floodplains have been determined across the county and Lake City (see Figure 4-22 and Figure 4-23). The effective maps are dated September 30, 1987. As of 2019 the Colorado Water Conservation Board and Wood Environment and Infrastructure Solutions was conducting a new mapping study that will eventually result in revised effective FIRMs for the County and Lake City.

Extent (Magnitude/Severity)

Hinsdale County is characterized by extremely diverse terrain. The varying and diverse topography, when viewed in combination with flood maps, can be an indicator of flood magnitude or severity depending on location and other local conditions such as development. Deeper and faster flood flows (such as present when rivers originate from high peaks and flow into low catchment areas over smaller distances) could cause great community damage across the County. However, shallow flooding with higher flows (such as generated from a storm or flash flood event) can cause similar damage.

Previous Occurrences

During the spring and early summer months the County can experience flooding rain events and, depending on the snowpack accumulation, can combine with heavy snowmelt runoff which can result in floods. The National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) Storm Events database notes several significant flash flood events that have taken place in Lake City between 1996 and 2014. Those which took place previous to 1996 were sourced from the previous County Hazard Mitigation Plan or other documents/local resources.

- **1921** – The Upper Lake Fork Valley flood occurred in 1921 and is thought to be the flood of record. After an unusually high spring runoff attributed to heavy snowmelt in addition to heavy rain fall

(estimated to be 7 inches) from June 3rd to June 10th the Lake Fork and Henson Creek overtopped their banks and threatened the Town of Lake City. Severe erosion occurred along streets and the Gunnison Avenue Bridge over Henson Creek washed out. Damage to buildings was limited.

- **1970** – A Disaster Declaration (DR 293) was approved due to heavy rains and flooding.
- **1973** – A Disaster Declaration (DR 396) was approved due to flooding and landslides
- **1984** – This flooding event along the Lake Fork River resulted in damage to roads and sanitary systems, and involved Federal assistance being disbursed due to the severity. A Disaster Declaration (DR 719) was approved due to the severe storms, mudslides, landslides, and flooding that occurred across the county.
- **July 17, 1996** - Flash flooding occurred along an eight mile stretch from Lake City to about 2 miles southwest of Lake San Cristobal. Mud and rockslides covered roads and flowed onto residential properties. Several roads were washed out in places. It took over 3 weeks for road crews to repair roads and remove debris which included large boulders. Around 1.50 inches of rain was reported in a 45-minute period at Lake City. Heavier rainfall was estimated upstream around the Lake San Cristobal area. The event lead to an estimated \$30,000 in property damage.
- **August 4, 1999** - A flash flood washed several tons of rock and other debris from Nourse Creek onto State Highway 149. The event let to an estimated \$1,000 in property damage.
- **August 5, 1999** - A flash flood occurred down Little Slumgullion Creek. The creek left its banks and washed a wide span of mud and other debris throughout an RV park. The driveway to the RV park was damaged. An estimated \$2,000 in property damage occurred.
- **July 16, 2000** - Heavy rains which fell for about 60 minutes resulted in rapid water runoff and numerous mud and rock slides off of Sunshine Mountain, in the Slumgullion Pass. There were 10 large debris slides along a three mile stretch of the Burrows Park/Cinnamon Pass Road. Each slide covered 50 to 60 yards of the road. Debris from three of the slides was 10 to 12 feet deep on the road, while the other debris deposits were 4 to 6 feet deep on the road. At least a dozen vehicles were trapped between the slides. And several vehicles were hit by smaller slides and received some damage. Around 48 people were trapped by the slides and had to be evacuated. It took the county road crew about a week to remove the debris from the road.
- **July 11, 2014** - Heavy rainfall near Lake City with amounts of over an inch caused flash flooding which closed Highway 149 and deposited a large amount of debris onto the road.

Other general flooding related details based on past events or flood hazard issues are noted in the following list:

- Sherman flooded around the year 1880
- There are debris flow issues out of Cataract Gulch, off the Sherman Campground and Cottonwood Creek
- Other debris flow issues include confluence buildup on Henson Creek (also known as Hensen Falls Creek) to the southwest of Lake City
- A wet microburst occurred in the summer of 2012
- Spring/Summer 2019: In May 2019, after a season of heavy snow fall and unprecedented avalanche activity, the County in conjunction with the State of Colorado Office of Emergency Management and adjacent counties prepared for major flooding events to occur. Several avalanches occurred in the Henson Creek basin just during the winter of 2018-2019 that resulted in massive amounts of debris being dumped into the county's waterways. This created much concern for flooding in and around

Lake City. A significant flood preparedness effort included sandbagging multiple sites in and around Lake City. Wildland fire crews removed much of the woody debris in the creeks. The removal of the debris is thought to have averted flooding downstream in June and July, coupled with gradual melting of the snowpack during an unusually cool spring and early summer.

Probability of Future Occurrences

Nearly every year there is a flood somewhere in the county, thus the probability is rated Highly Likely. Large floods occur less frequently. The 100-year flood is the flood that has a one percent chance in any given year of being equaled or exceeded. Flooding events more severe than a 100-year flood can occur as well, but have a lower likelihood. The 500-year event has a 0.2% chance of occurring in a single year.

Other Future Flooding/Flooding Outside the FEMA Special Flood Hazard Areas

Based on historical evidence, in addition, it is expected that localized storms or even flash flooding will affect Lake City and Hinsdale County in the near future, even if not currently mapped or identified by FEMA's special flood hazard areas. The historic record indicates a significant flood approximately every 10 years in the County.

Climate Change Considerations

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

Vulnerability

During the 2019 HMP update, the following vulnerability analysis using GIS was performed to further quantify property and values at risk to flooding.

General Property

A flood vulnerability assessment was performed for Hinsdale County using GIS methods. The spatial analysis utilized flood hazard area layers digitized from the effective FIRM panels as well as publicly available building footprints from Microsoft. The two were overlaid to count how many buildings are within the hazard areas. The digitized FIRM panels show FEMA's effective flood risk, which depicts the 1% annual chance (100-year) and the 0.2% annual chance (500-year) flood events, and these digitized layers were determined to be the best available floodplain data for Hinsdale County. Table 4-27 Hinsdale County's Flood Hazard Zones summarizes and defines the flood zones included on these maps.

Table 4-27 Hinsdale County's Flood Hazard Zones

Flood Zone	Definition
Special Flood Hazard Areas (SFHA) Subject to Inundation by 100-Year Flood	
Zone A	No base flood elevations determined
Zone AE	Base flood elevations determined
Other Flood Areas	
Zone X (with color coding)	Areas of 0.2 percent annual chance flood (i.e., 500-year flood); areas of 1 percent annual chance flood with average depths of less than 1 foot or with

	drainage areas less than 1 square mile; and areas protected by levees from 1 percent annual chance flood
Other Areas	
Zone X (with no shading)	Areas determined to be outside the 0.2 percent annual chance floodplain

Source: FEMA

Figure 4-24 and Figure 4-25 display the building footprints that were found to overlap with flood hazard layers in Hinsdale County and Lake City, respectively. Table 4-28 below summarizes the total building footprints found within each flood hazard event by jurisdiction, along with an estimated value based on average residential property values based on data from the county's Assessor's Office. Contents values were estimated for the buildings based on FEMA values. This includes 50% of the structure value for residential structures. 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 two-foot-deep flood.

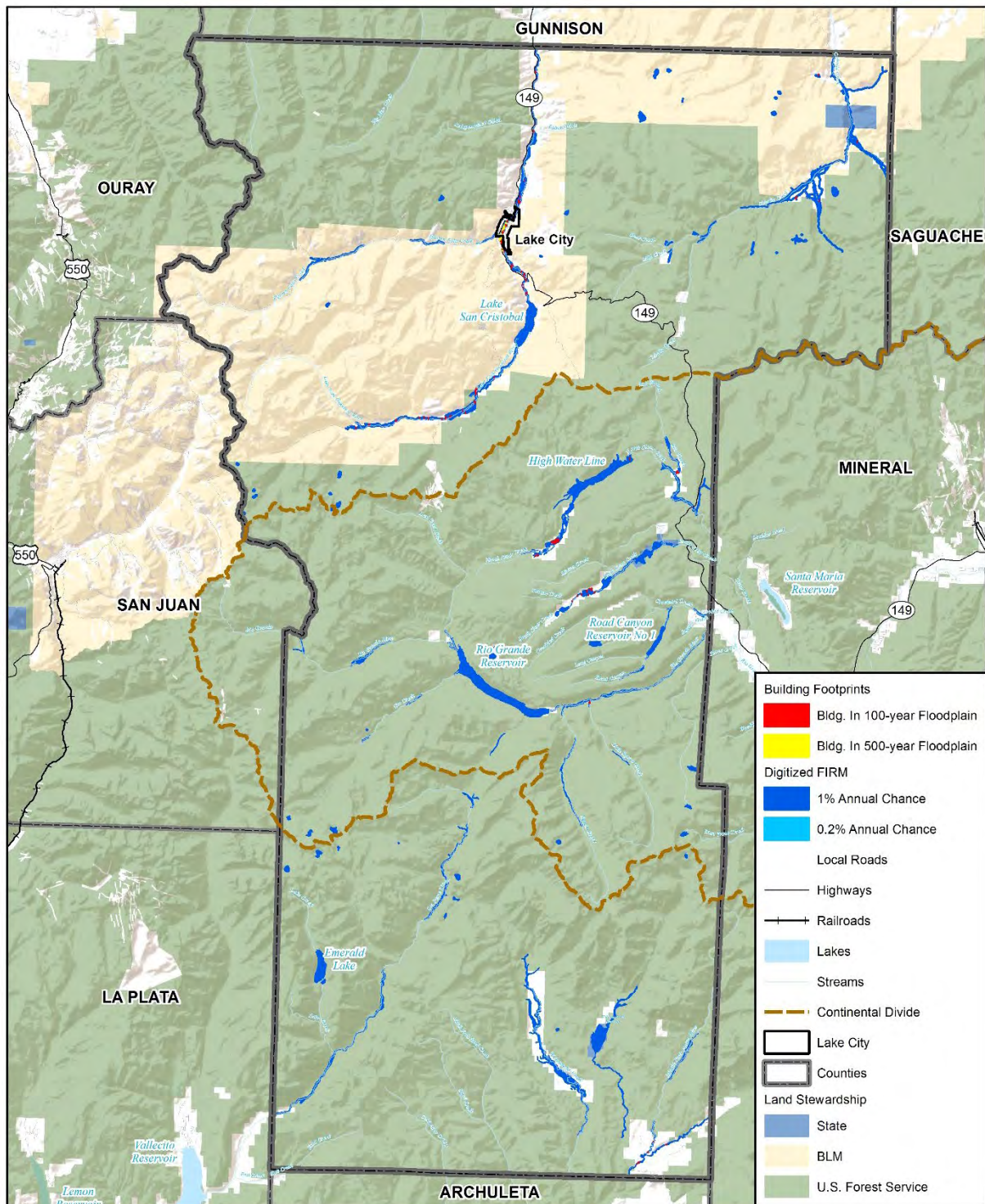
The GIS analysis shows that a total of 150 buildings are at risk of the 100-year flood event (14 in Lake City and 136 from the rest of the County), while 44 additional buildings are located within the 500-year floodplains (17 from Lake City and 27 from the unincorporated Hinsdale County areas).

Table 4-28 Building Footprints in Flood Hazard Areas by Jurisdiction and Flood Event

Flood Event	Location	Buildings at Risk	Residential Actual Value Estimates	Content Values	Total Values	Loss Estimates (25% of the Residential Actual Value Estimates)	Population at Risk
100-Year	Lake City	14	\$2,657,501	\$1,328,750	\$3,986,251	\$996,563	31
500-Year		17	\$3,226,964.94	\$1,613,482	\$4,840,447	\$1,210,112	38
TOTAL		31	\$5,884,465	\$2,942,233	\$8,826,698	\$2,206,675	69
100-Year	Unincorporated	136	\$25,606,019	\$12,803,009	\$38,409,028	\$9,602,257	302
500-Year		27	\$5,083,548	\$2,541,774	\$7,625,322	\$1,906,330	60
TOTAL		163	\$30,689,567	\$15,344,783	\$46,034,350	\$11,508,587	362
GRAND TOTAL		194	\$36,574,032	\$18,287,016	\$54,861,048	\$13,715,262	431

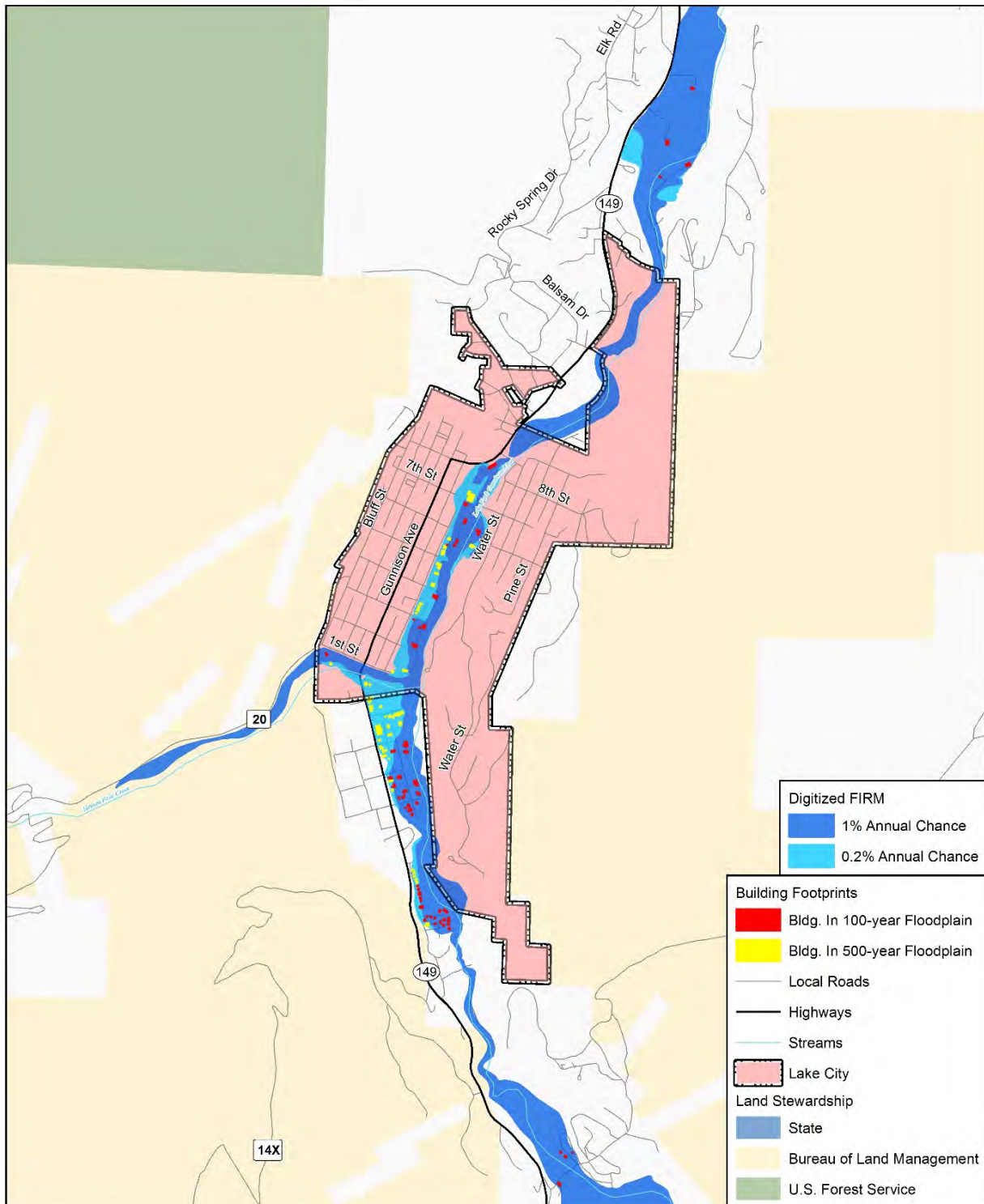
Source: Hinsdale County Assessor's Office, Microsoft Footprints/Open Street Map, FEMA, Wood Plc analysis

Figure 4-24 Buildings in Flood Hazard Areas Across Hinsdale County



Map compiled 9/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, CO BLM,
Microsoft Footprints, FEMA NFHL, Wood Plc

Figure 4-25 Lake City Buildings in Flood Hazard Areas



wood.
Map compiled 9/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, CO BLM,
FEMA Digitized FIRM, Wood Plc, Microsoft Footprints

0 0.5 1 Miles



Insurance Coverage, Claims Paid, and Repetitive Losses

Hinsdale County joined the National Flood Insurance Program (NFIP) in emergency status in June 26, 1975 (though its regular entry date was September 30, 1987); Lake City entered the program slightly earlier that month but also in emergency status, in June 17, 1975 (with the same regular entry as the County). The County and Lake City do not participate in the Community Rating System (CRS) as of 2019.

Overall, Hinsdale County contains 8 insured properties under the NFIP. Per FEMA's Community Information System (CIS) reports, the unincorporated county has 3 properties falling in A Zones, while 5 are in B, C & X preferred Zones.

Lake City has a total of 8 properties are in A01-30 and AE Zones, while 5 fall in B, C & X preferred Zones for a total of 13 insured properties in the Town. Twelve (12) of these are single family residences, and 1 is a non-residential property.

Flood Insurance Policies and Repetitive Loss Properties

FEMA insures properties against flooding losses through the NFIP. As part of the process to reduce or eliminate repetitive flooding to structures across the United States, FEMA has developed an official Repetitive Loss Strategy. The purpose behind the national strategy is to identify, catalog, and propose mitigation measures to reduce flood losses to the relatively few numbers of structures that absorb the majority of the premium dollars from the national flood insurance fund.

A repetitive loss property is defined by FEMA as "a property for which two or more NFIP losses of at least \$1,000 each have been paid within any 10-year period since 1978". A repetitive loss property may or may not be currently insured by the NFIP. There are no repetitive loss buildings in Lake City, and none in the unincorporated portions of the County. There are not any severe repetitive loss properties either. Table 4-29 summarizes these NFIP and CIS details.

Table 4-29 Hinsdale County and Lake City Community Information System Details

Jurisdiction	Policies	Insurance in Force	Number of Paid Losses	Total Losses Paid
Lake City	13	\$3,746,200	\$0	\$0
Hinsdale County	8	\$2,303,800	\$0	\$0
Total	21	\$6,050,000	\$0	\$0

Source: FEMA National Flood Insurance Program - Community Information System

People

People can be vulnerable to flooding hazards if they are caught in areas of inundation or possible secondary/cascading effects such as debris flow, which may lead to injury or death. There is also a danger to drivers operating vehicles, as rocks and debris carried by flood waters can strike vehicles passing through the hazard area or cause dangerous shifts in roadways. In addition, a flood may cause persons to drown or ingest contaminated waters. Based on Table 4-28 in the previous sub-section, an estimated 431 people could be at risk of flooding or related hazards in the entire county. At risk population was estimated by multiplying the average number of persons living in each household in Hinsdale County (which is 2.22 per home) times the number of building footprints falling within flood hazard areas. About 333 people would be at risk during the 100-year flood event, while 98 additional would be at risk during



the 500-year flood event. Around 69 people are estimated to reside in Lake City floodplains, and 362 in the general unincorporated county portions of flood hazard areas.

In addition, tourists and campers adjacent to Henson Creek or other popular areas can be vulnerable to flooding hazards may not be well prepared to handle floods.

Critical Facilities and Infrastructure

Key support facilities and structures most necessary to withstand the impacts of, and respond to, natural disasters are referred to as critical facilities. Examples of these critical facility types include utilities, transportation infrastructure, and emergency response and services facilities. Failures of components along major lifelines or even closures or inaccessibility to key emergency facilities could limit if not completely cut off transmission of commodities, essential services, and lead to other potentially catastrophic repercussions. Table 4-30 summarizes the number and types of critical facilities found to be at risk of flooding, based on flood hazard area and jurisdiction. These results were found by performing overlay analysis of the critical facilities and the flood hazard area layers in GIS. All of these facilities at risk (three) are found in Lake City. Two of these are located in the 500-Year, or 0.2% annual chance, flood hazard zone, while only one falls in the 100-year, or 1% annual chance, flood hazard zone based on digitized effective FIRM panels from FEMA. Figure 4-26 below shows the critical facilities in floodplains areas in Lake City. It is also worth noting that, per HMPC input, additional facilities have been historically found in the floodplain, including the Lake City wells and the Lake San Cristobal water system.

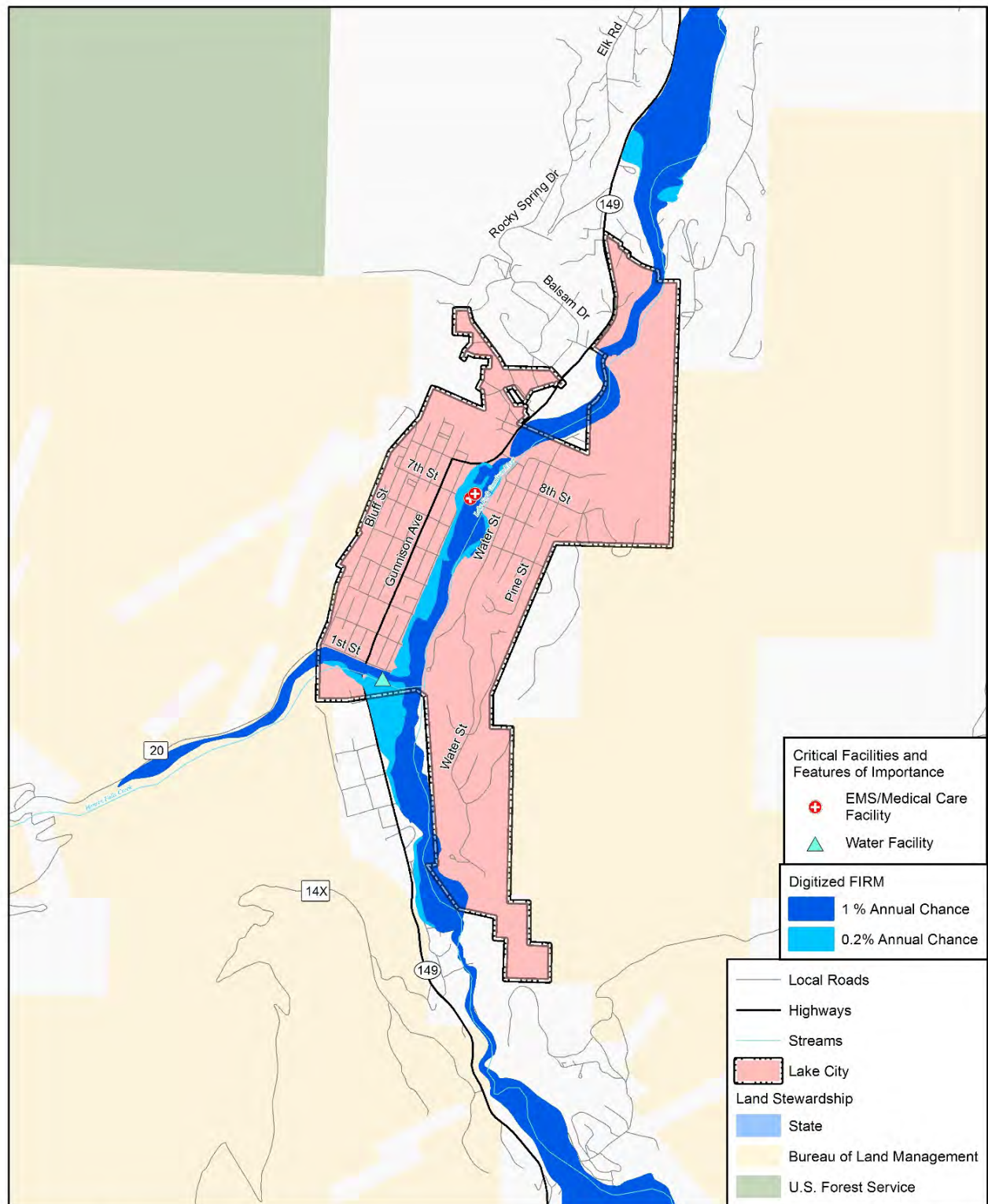
Table 4-30 Critical Facilities in Flood Hazard Areas (the 500-Year Floodplain) by Jurisdiction

Jurisdiction	Flood Hazard Area	Critical Facility Name	Critical Facility Type	Total
Lake City	100-year	Well House 2	Water Facility	1
	500-year	Hinsdale County Emergency Medical Services and Lake City Volunteer Ambulance	Medical Care Facility	2
		Moseley Medical Center		
TOTAL				3

Source: Hinsdale County, Microsoft Footprints/Open Street Map, FEMA, Wood Plc analysis



Figure 4-26 Critical Facilities in Floodplain Areas in Lake City



wood.
Map compiled 8/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, CO BLM,
FEMA Digitized FIRM, HIFLD, Wood Plc

Economy

Flooding can have a major economic impact on the economy, including indirect losses such as business interruption, lost wages, and other downtime costs. Flooding often coincides with the busy summer tourism months in Hinsdale County. Even the threat of flooding can have an impact. This was observed during June 2019 when area hotel bookings were down more than normal due to anticipated flooding.

Historic, Cultural, and Natural Resources

There are numerous significant historic, cultural, and natural resources located throughout the County. GIS analysis of data from the National Register of Historic Places did not indicate historic properties are at risk to flooding based on the effective FEMA flood hazard area delineations.

Natural areas within the floodplain often benefit from periodic flooding as a naturally recurring phenomenon. These natural areas often reduce flood impacts by allowing absorption and infiltration of floodwaters. Natural resources are generally resistant to flooding except where natural landscapes and soil compositions have been altered for human development or after periods of previous disasters such as drought and fire. Wetlands, for example, exist because of natural flooding incidents. Areas that are no longer wetlands may suffer from oversaturation of water, as will areas that are particularly impacted by drought. Areas recently suffering from wildfire damage may erode because of flooding, which can permanently alter an ecological system.

Future Development

For NFIP participating communities (Lake City and the County as a whole), floodplain management practices implemented through local floodplain management ordinances should mitigate the flood risk to new development in floodplains.

Risk Summary

- Overall significance of the flood hazard is **High**.
- A total of 150 buildings are at risk of the 100-year flood event (14 in Lake City and 136 from the rest of the County)
- A total of 2 critical facilities are found in 500-year floodplain and 1 in the 100-year floodplain, all in Lake City.
- *Related hazards:* Wildfire, Landslide/Debris Flow, Avalanche, Dam Incident.

Table 4-31 Flood Hazard Risk Summary

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Hinsdale County	Limited	Highly Likely	Critical	High
Town of Lake City	Significant	Highly Likely	Critical	High

4.3.6 Landslides, Debris Flow, and Rockfall

Hazard/Problem Definition

A **landslide** is a geologic hazard where the force of gravity combines with other factors to cause earth material to move or slide down an incline. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Slopes with the greatest potential for sliding are between 34 degrees and 37 degrees. Although steep slopes are commonly present where landslides occur, it is not necessary for the slopes to be that way in order to pose a threat of landslide.

Debris flows are a mixture of rock fragments, soil, vegetation, water and, in some cases, entrained air that flows downhill as a fluid. Debris flows can range in consistency from that of freshly mixed concrete to running water. Debris flows can be further classified as mudflows and earth flows depending on the ratio of water to soil and rock debris.

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

Landslides, rockslides, and debris flows occur continuously on all slopes; some processes act very slowly, while others occur very suddenly, often with disastrous results. Landslide and debris flow problems can be caused by land mismanagement, particularly in mountain and canyon areas. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides and debris flows. Spring is typically the landslide/rockfall season in Colorado as snow melts and saturates soils and temperatures enter freeze/thaw cycles. Rockfall and landslides are influenced by seasonal patterns, precipitation and temperature patterns.

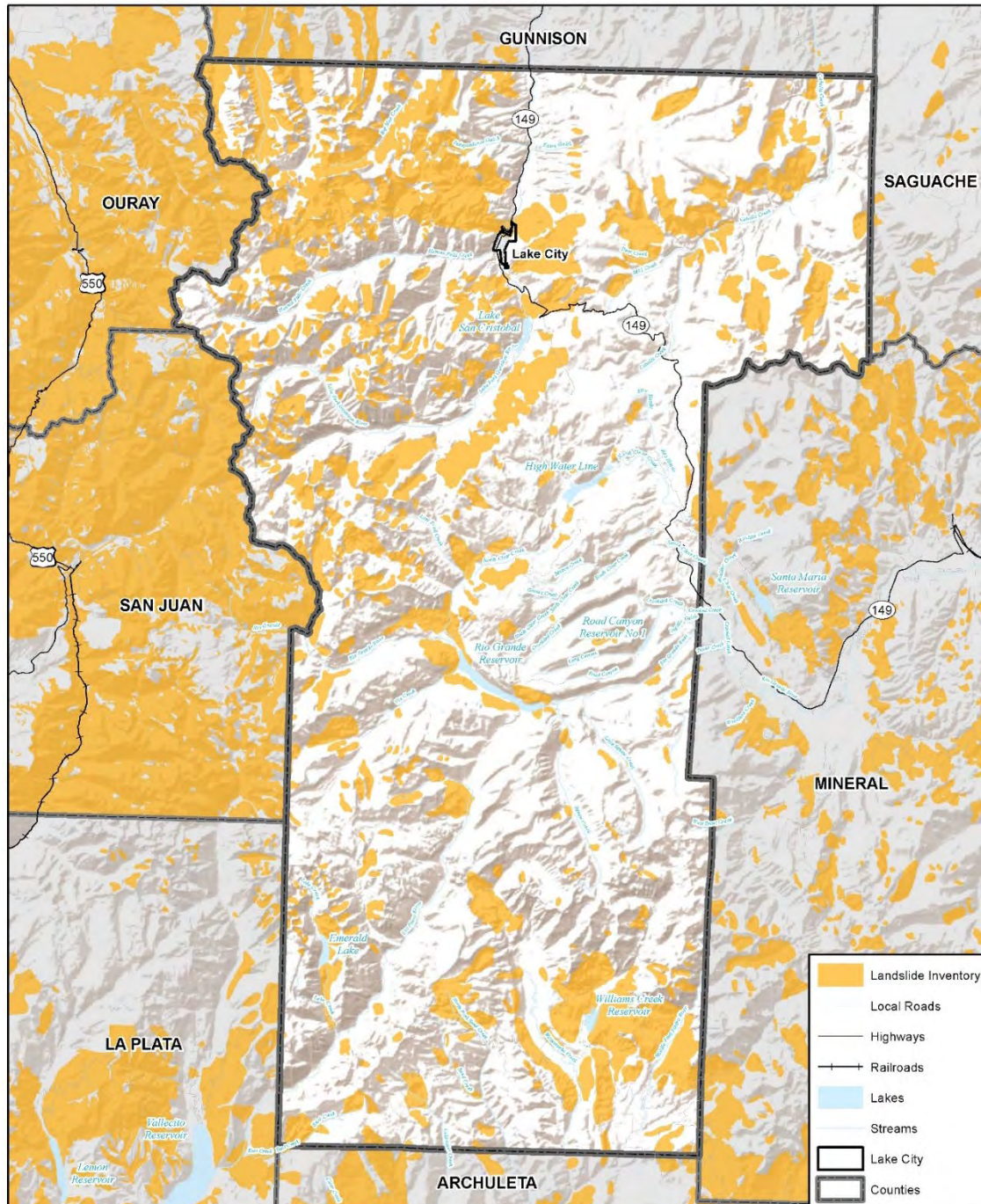
There are predictable relationships between local geology and landslides, rockslides, and debris flows. The down-slope movement of earth material, either as a landslide, debris flow, mudslide, or rockslide, is part of the continuous, natural process of erosion. This process, however, can be influenced by a variety of causes that change the stability of the slope. Slope instability may result from natural processes, such as the erosion of the toe of a slope by a stream, or by ground shaking caused by an earthquake. Slopes can also be modified artificially by grading, or by the addition of water or structures to a slope. Development that occurs on a slope can substantially increase the frequency and extent of potential slope stability hazards. Knowledge of these relationships can improve planning and reduce vulnerability. Slope stability is dependent on many factors and their interrelationships, including rock type, moisture content, slope steepness, and natural or man-made undercutting.

Geographic Area

In Hinsdale County, there are several geologic formations commonly associated with slope stability problems. The data presented in Figure 4-27 is a summary of landslide hazard potential. The represented

landslide data was obtained from (and being used with permission of) the Colorado Geological Survey (CGS). This map shows that about 21% of the county is exposed to landside hazards across the entire planning area.

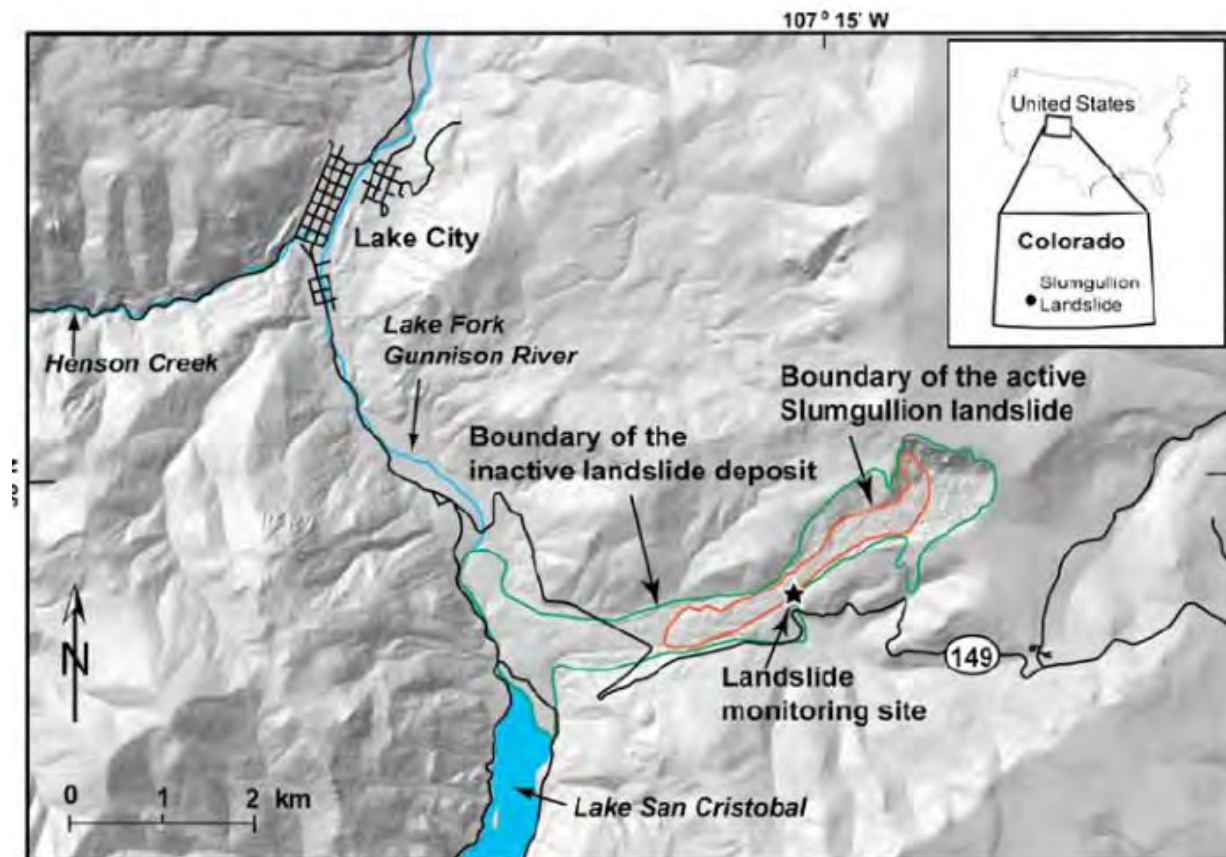
Figure 4-27 Landslide Potential in Hinsdale County



Map compiled 5/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, CGS

The main geologic formation commonly associated with slope stability problems in Hinsdale County is the Slumgullion formations. This landslide area is located in the San Juan Mountains, a few miles southeast of Lake City along Highway 149 (see Figure 4-28). This landslide area is thought to move continuously at a rate of about 7 meters per year. This earthflow was also what created Lake San Cristobal just south of Lake City, along the Lake Fork Gunnison River, about 600 years back. Because of the importance of this landslide area, the USGS monitors the middle of the active earthflow area.

Figure 4-28 The Slumgullion Landslide Area in Hinsdale County



Source: Jonathan P. McKenna and William H. Schulz. September 2009

The susceptibility of areas underlain by this Slumgullion formation to slope stability impacts will vary based on a variety of site-specific factors, such as slope, the orientation of bedding planes, rainfall, characteristics of the overlying soil, and the type and extent of proposed slope modifications. In some areas, slopes may be stable in a natural condition, but alterations to the hillsides to accommodate development may cause unstable conditions that could adversely affect future development. Prior to the initiation of new development that could be adversely affected by slope movement, site specific evaluations are necessary to determine the hazard potential and to identify engineering design methods to minimize the risk of landslide-related damage.

Extent (Magnitude/Severity)

The extent of landslides and debris flow events within the county range from negligible to significant. Landslides and rockslides can result in the destruction of infrastructure such as water and sewer lines,

electrical and telecommunications utilities and drainage. Disrupted transportation routes occur occasionally, usually during heavy rain storms, and cause considerable inconvenience and result in economic impacts. The potential for complete destruction of buildings and death and injury from landslides and debris flow also exists.

Previous Occurrences

1977 - A mudflow near the Lake View Resort, which is located on the edge of Lake San Cristobal at the bottom of the Slumgullion Slide, resulted in a disaster declaration back in 1977 as it caused significant damages.

1997 - A large landslide in West Lost Trail Creek in 1997 involved acres' worth of damages.

2000 - A rockslide caused by heavy rains on Sunshine Peak closed the Shelf Road on Cinnamon Pass in 2000, temporarily trapping several dozen motorists; some were actually caught and stranded in the active rock slide.

August 5, 2013 - A debris flow caused by heavy rainfall from a thunderstorm closed Highway 149 between mile markers 77 and 79 for several hours, near Lake City. This event was reported by the Department of Highways.

July 27, 2017 - Heavy rainfall resulted in a rockslide across Highway 30 between Highway 149 and Lake San Cristobal.

August 3, 2019 – Heavy rainfall caused a debris flow that stranded approximately 60 persons on County Rd 30. It took County first responders several hours to evacuate the stranded people to safety.

Probability of Future Occurrences

Based on historical data and the planning area's geology and topography, landslides, debris flows, and rockfalls are a common occurrence. As such, it is highly likely that these hazards will continue to affect the county and Lake City in the future, so that a near 100% chance of occurrence in the next year is expected, though damaging landslides will occur less frequently due to the sparse development and low population in the County.

Climate Change Considerations

Landslides can result from intense rainfall and runoff events. Projected climate change-associated variance in rainfall events may result in more high-intensity events, which could increase landslide frequency, particularly debris flows. In addition, the increased potential of wildfire occurrence also escalates the risk of landslide and debris flows in the period following a fire, when slopes lack vegetation to stabilize soils and burned soil surfaces create more rainfall runoff.

Vulnerability

General Property

Landslides can directly damage structures in two general ways: 1) disruption of structural foundations caused by differential movement and deformation of the ground upon which the structure sits, and 2) physical impact of debris moving downslope against structures located in the travel path. Properties and buildings are often damaged by this hazard due to structural foundation instability.

During the 2019 update of this plan, a GIS analysis of property exposure to landslide hazard areas was performed. This analysis took into account the landslide hazard GIS layers from the CGS as well as the Microsoft Footprints, to assess the number of buildings within the areas of potential hazard.

The GIS analysis indicates 364 buildings fall within these landslide areas, with most of those (for a total of 268) being in the unincorporated portions of Hinsdale County. Table 4-32 below summarizes the totals of buildings found within landslide inventory areas, along with the sum of the estimated value estimates for each jurisdiction. Figure 4-29 and Figure 4-30 display the buildings that overlap with landslide areas across the County and Lake City, respectively. The analysis should be considered an initial exposure assessment; a more detailed site-specific analysis by a geotechnical professional would be needed to refine vulnerability further.

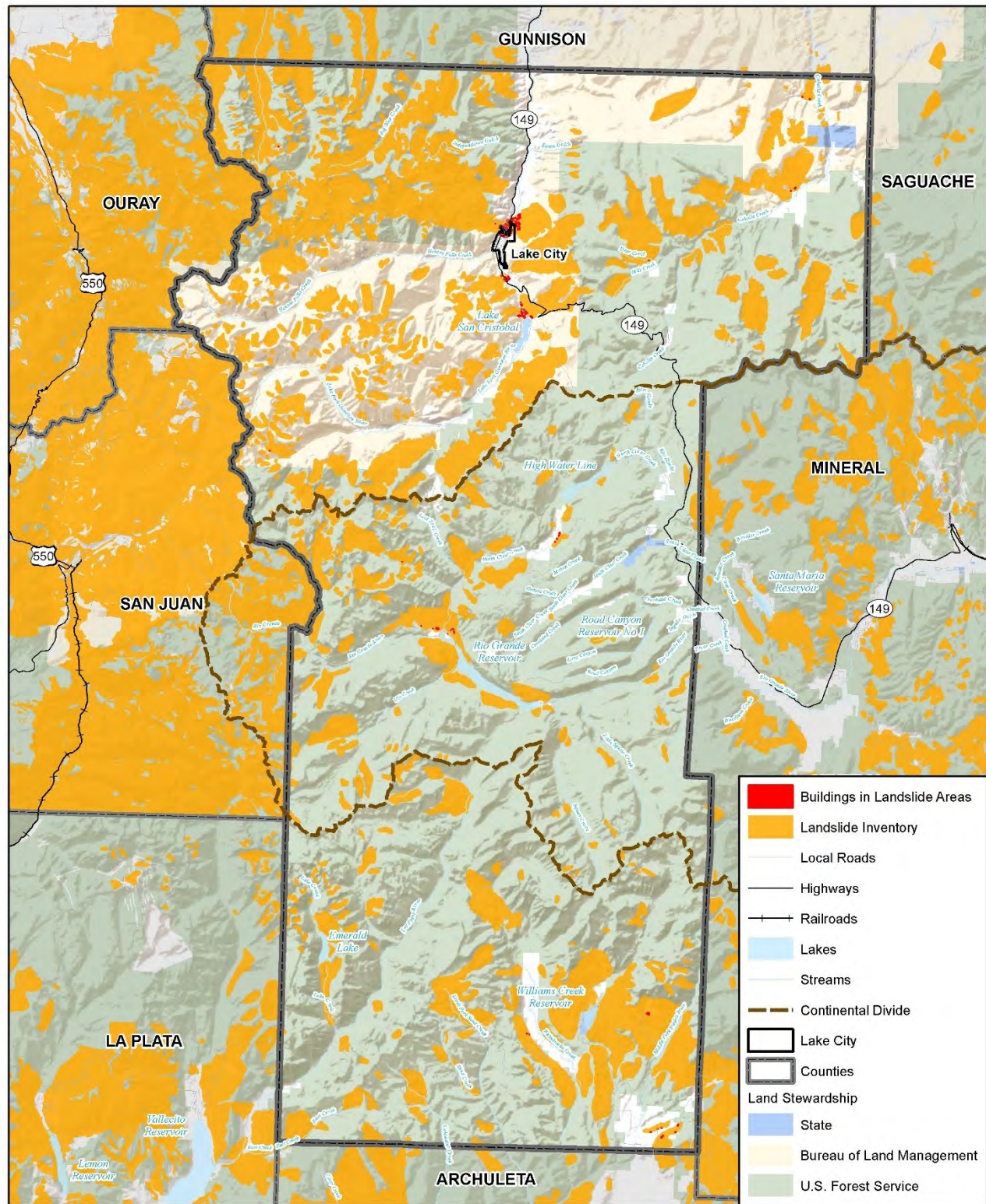
Table 4-32 Buildings Potentially Exposed to Landslides by Location

Location	Building Count	Exposure Values (from Residential Actual Value Estimates)	Content Values	Total Values	Population at Risk
Lake City	96	\$18,222,861	\$9,111,430	\$27,334,291	213
Unincorporated	268	\$50,458,919	\$25,229,460	\$75,688,379	595
TOTAL	364	\$68,681,780	\$34,340,890	\$103,022,670	808

Source: Hinsdale County, Colorado Geological Survey, Microsoft Footprints/Open Street Map, Wood Plc analysis



Figure 4-29 Buildings within Landslide Areas across Hinsdale County



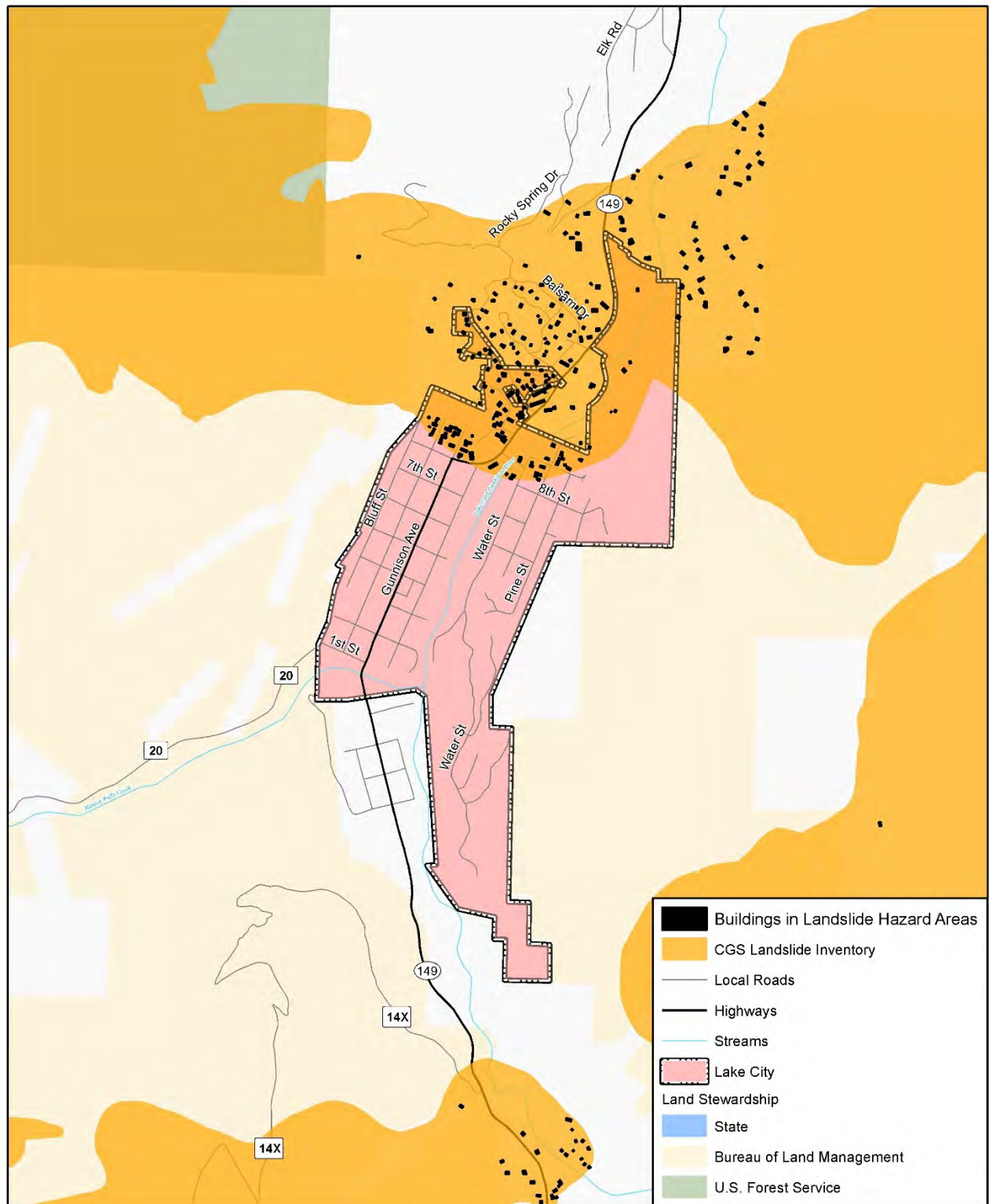
wood.

Map compiled 5/2019,
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, CGS, CO BLM,
Microsoft Footprints

0 10 20 Miles



Figure 4-30 Buildings within Landslide Areas in Lake City



wood.

Map compiled 5/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal,
CO BLM, CGS, Microsoft Footprints

0 0.5 1 Miles



People

People could be susceptible if they are caught in a landslide or debris flow, potentially leading to injury or death. There is also a danger to drivers operating vehicles, as rocks and debris can strike vehicles passing through the hazard area or cause dangerous shifts in roadways. Based on Figure 4-30 above, an estimated 808 people could be at risk of landslide hazards in the entire county. At risk population was estimated by multiplying the average number of persons living in each household in Hinsdale County (which is 2.22 per home) times the number of building footprints where landslide terrain has been inventoried. Note that this number is roughly equal to the year-round population of the County, but likely representative of the population in second homes during the influx of summer tourism, which often coincides with seasonal landslide, rockfall and debris flows.

Critical Facilities and Infrastructure

In addition to buildings, utilities and transportation infrastructure is vulnerable to the impact and ground deformation caused by slope failures. They present a particular vulnerability because of their geographic extent and susceptibility to physical distress. Lifelines are generally linear structures that, because of their geographic extent, have a greater chance of being affected by ground failure due to greater hazard exposure.

Based on the HMPC County Road 30, County Road 20, and Highway 149 have been impacted by or potentially at risk of landslide activity. Also, Rio Grande Reservoir could be impacted by landslides near the left abutment of the dam; a geologic mapping and landslide evaluation effort has been completed by consultants for the San Luis Valley Irrigation District as part of a dam and reservoir rehabilitation study.

Extension, bending, and compression caused by ground deformation can break lifelines. Failure of any component along the lifeline can result in failure to deliver service over a large region. Once broken, transmission of the commodity through the lifeline ceases, which can have catastrophic repercussions down the line: loss of power to critical facilities such as hospitals, impaired disposal of sewage, contamination of water supplies, disruption of all forms of transportation, release of flammable fuels, and so on. Therefore, the overall impact of lifeline failures, including secondary failure of systems that depend on lifelines, can be much greater than the impact of individual building failures.

Table 4-33 summarizes the results of GIS overlay analysis, which includes the types of critical facilities that are located in areas where landslide activity has been inventoried in the past. There are a variety of facilities at risk, including transmission towers, station transmitters, wastewater treatment facilities, and miscellaneous/other facilities or structures. There is only one facility at risk in Lake City, while 7 are found in the unincorporated areas of Hinsdale County.



Table 4-33 Critical Facilities within Landslide Inventory Zones, by Jurisdiction and Facility Type

Jurisdiction	Critical Facility Type	Total Facilities
Lake City	Miscellaneous/Other	1
	HazMat	1
TOTAL		2
Unincorporated	FM Transmission Towers	2
	Miscellaneous/Other	1
	TV Analog Station Transmitters	1
	Wastewater Treatment Facilities	2
TOTAL		6
GRAND TOTAL		8

Source: Hinsdale County, HIFLD, Wood GIS analysis

Economy

Economic impacts typically center around transportation routes temporarily closed by debris flow, mudflow, or landslide activity. These roads may be used to transport goods across the county or provide access by visitors and tourists. Depending on the amount of damage, the road may simply need to be cleaned off, or may need some level of reconstruction and affect the local economy indirectly.

Historic, Cultural, and Natural Resources

As primarily a natural process, landslides and debris flows can have varying impacts to the natural environment; debris flows have the potential to permanently alter the natural landscape. The potential for landslide dams is real, as evidenced by the presence of the Slumgullion Slide which formed Lake San Cristobal. Lakes that form behind landslides can potentially cause flooding downstream should the natural dam be overtopped or blown out by the pressure of the impounded water.

GIS analysis indicates that there is 1 historic property potentially at risk to landslides. It is the Debs School located on the southeast portion of Hinsdale County, near Road 633.

Future Development

Future development should consider potential landslide hazards. Adverse effects can be mitigated by early recognition and avoiding incompatible land uses in these areas or by corrective engineering. 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.

Risk Summary

The overall significance of landslides, rockfall and debris flows in Hinsdale County is High. These events are recurring in nature and could disrupt critical elements of the county's infrastructure as well potentially cause damage to homes and populations.

- The main geologic formation commonly associated with slope stability problems in Hinsdale County is the Slumgullion Slide area to the southeast of Lake City, one of the largest landslides in the state.
- *Effects on people:* People and property are at risk from landslides and debris flow in Hinsdale County. Past incidents have not resulted in significant injuries or loss of life. However, based on the GIS analysis performed, some people could be at risk of injury based on the location of buildings in Lake



City and Hinsdale County which overlap with landslide inventory areas. Motorists and backcountry enthusiasts could also be susceptible.

- *Effects on property:* Property loss is rare but is usually significant when it occurs; a high number of structures are built on or near landslide potential areas based on GIS analysis. This analysis yielded that 96 buildings are found to overlap with landslide inventoried areas within Lake City, while a total of 268 buildings overlap with landslide inventory areas in the unincorporated portions of the county.
- *Effects on economy:* Landslides and debris flows in adjacent counties can disrupt major transportation corridors especially near the Slumgullion area, by Highway 149, affecting the local tourist economy, services, and transport of goods.
- *Effects on critical facilities and infrastructure:* Landslides and debris flows can result in the destruction of infrastructure such as water and sewer lines, electrical and telecommunications utilities and drainage. Disrupted transportation routes occur occasionally, usually during heavy rain storms, and cause considerable inconvenience. Based on GIS analysis, there are 8 critical facilities found within landslide inventory zones across the county. 1 is located in Lake City, while the other 7 in unincorporated portions. County Road 30, County Road 20, and Highway 149 have been impacted by or potentially at risk of landslide activity.
- *Related Hazards:* Earthquake, Severe Weather, Wildfire, Dam Failure.

Table 4-34 Risk Summary by Jurisdiction

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Hinsdale County	Extensive	Highly Likely	Critical	High
Lake City	Extensive	Occasional	Critical	Medium

4.3.7 Severe Thunderstorm Activity

Hazard/Problem Definition

Hinsdale County's geographic location, scenic peaks, valley, and unique weather patterns combine to produce sometimes severe thunderstorm activity. This activity includes heavy rain, intense lighting, stout winds, micro-bursts, and large hail.

Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado.

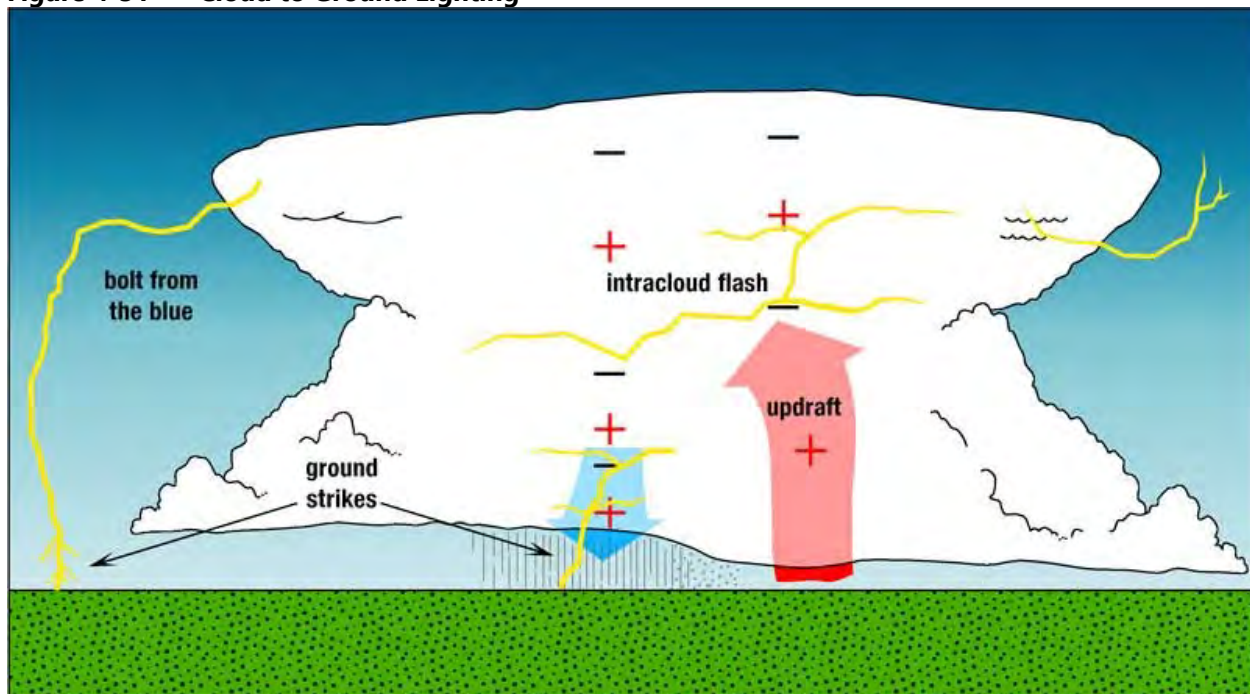
Hail is formed when water droplets freeze and thaw as they are thrown high into the upper atmosphere by the violent internal forces of thunderstorms. Hail is sometimes associated with severe storms within the Hinsdale County planning area. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 miles per hour (mph). Severe hailstorms can be quite destructive, causing damage to roofs, buildings, automobiles, vegetation, livestock and crops.

Lightning is defined as any and all of the various forms of visible electrical discharge caused by thunderstorms. Thunderstorms and lightning are usually (but not always) accompanied by rain. Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually it takes place inside the cloud and looks from the outside of the cloud like

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

Cloud-to-ground lightning is the most damaging and dangerous type of lightning, though it is also less common. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat (see Figure 4-31). Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage.

Figure 4-31 Cloud to Ground Lightning

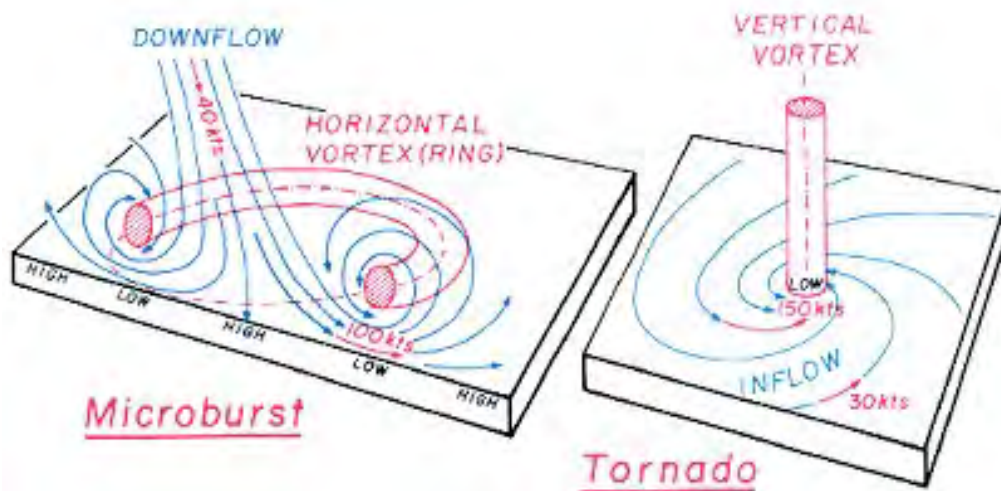


Source: National Weather Service Pueblo Office

High wind events and tornadoes are also possible during a severe thunderstorm event. Microbursts, a subcategory of high winds, have the ability to induce dangerous wind shears and generally last between five and fifteen minutes and impact an area less than three miles wide. Wet microbursts have a combination of wind and rain and/or hail. A microburst in 1997 in the Penniston Park area caused damage to the Lake View Resort as well as taking out a series of beaver dams initiating a flow of Slumgullion mud and rock.

The following images depicts the differences between microburst and a tornado event.

Figure 4-32 Schema of Microburst and Tornado

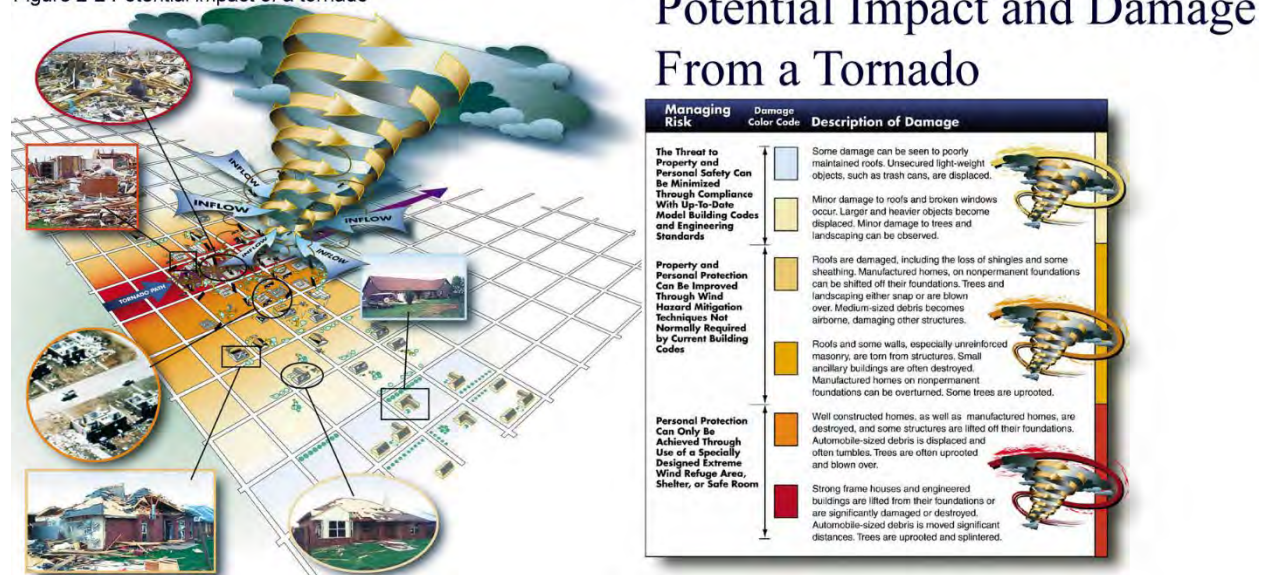


Source: NOAA

Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes are the most powerful storms that exist. They can have the same pressure differential that fuels 300-mile-wide hurricanes across a path only 300-yards wide or less. The destruction caused by tornadoes ranges from light to catastrophic depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings and particularly manufactured homes, the following figure illustrates the potential impact and damage from a tornado.

Figure 4-33 Potential Impact and Damage from a Tornado

Figure 2-2 Potential impact of a tornado



Source: FEMA Building Performance Assessment: Oklahoma and Kansas Tornadoes

Tornadoes are more likely to occur during the months of March through May and tend to form in the late afternoon and early evening. Although no tornadoes have occurred in Hinsdale County and mountainous-area tornadoes are rare, the possibility does exist.

Severe thunderstorms, especially those that involve high winds or tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, most injuries and deaths result from flying debris. Property damage can include damage to buildings, fallen trees and power lines, broken gas lines, broken sewer and water mains, and the outbreak of fires.

Geographic Area

Thunderstorms are generally expansive in size. The entire county is susceptible to any of the effects of a severe thunderstorm, including hail, heavy rain and high winds.

Extent (Magnitude/Severity)

Common problems associated with severe storms include the loss of utilities or immobility. Loss of life is uncommon but can occur during severe storms. Immobility can occur when roads become impassable due to heavy rains causing flooding, downed trees, or a landslide. Loss of utilities, specifically power lines can occur due to downed trees from high winds or lighting. Extent for severe weather, particularly severe thunderstorms that involve heavy rain, high wind hail can be measured according to hail by diameter sizes and wind speed.

The National Weather Service (NWS) classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. Table 4-35 below indicates the hailstone measurements utilized by the NWS.

There is no clear distinction between storms that do and do not produce hailstones. Nearly all severe thunderstorms probably produce hail aloft, though it may melt before reaching the ground. Multi-cell thunderstorms produce many hailstones, but not usually the largest hailstones. In the life cycle of the multi-cell thunderstorm, the mature stage is relatively short so there is not much time for growth of the hailstone. Supercell thunderstorms have sustained updrafts that support large hail formation by repeatedly lifting the hailstones into the very cold air at the top of the thunderstorm cloud. In general, hail 2 inches (5 cm) or larger in diameter is associated with supercells (a little larger than golf ball size which the NWS considers to be 1.75 inch.). Non-supercell storms are capable of producing golf ball size hail.

Table 4-35 Hail Measurements

Average Diameter	Corresponding Household Object
.25 inch	Pea
.5 inch	Marble/Mothball
.75 inch	Dime/Penny
.875 inch	Nickel
1.0 inch	Quarter
1.5 inch	Ping-pong ball
1.75 inch	Golf-Ball
2.0 inch	Hen Egg



Average Diameter	Corresponding Household Object
2.5 inch	Tennis Ball
2.75 inch	Baseball
3.00 inch	Teacup
4.00 inch	Grapefruit
4.5 inch	Softball

Source: National Weather Service

Lightning is measured by the Lightning Activity Level (LAL) scale, created by the National Weather Service to define lightning activity into a specific categorical scale. The LAL is a common parameter that is part of fire weather forecasts nationwide. Due to the high elevation and varied topography of the County, Hinsdale is at risk to experience lightning in any of these categories. The LAL is reproduced in Table 4-36 .

Table 4-36 Lightning Activity Level Scale

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

Source: National Weather Service

Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it takes into account the materials affected and the construction of structures damaged by a tornado. Table 4-37 shows the wind speeds associated with the original Fujita scale ratings and the damage that could result at different levels of intensity. Table 4-38 shows the wind speeds associated with the Enhanced Fujita Scale ratings. The Enhanced Fujita Scale's damage indicators and degrees of damage can be found online at www.spc.noaa.gov/efscale/ef-scale.html.



Table 4-37 Original Fujita Scale

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
F0	< 73	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F3	158-206	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated.
F5	261-318	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

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



Table 4-38 Enhanced Fujita Scale

Enhanced Fujita (EF) Scale	Enhanced Fujita Scale Wind Estimate (mph)	Potential Damage
EF0	65-85	Minor damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EF0.
EF1	86-110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	Considerable damage. Roofs torn off from well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations are badly damaged.
EF4	166-200	Devastating damage. Well-constructed and whole frame houses completely leveled; cars and other large objects thrown, and small missiles generated.
EF5	Over 200	Incredible damage. Strong-framed, well-built houses leveled off foundations are swept away; steel-reinforced concrete structures are critically damaged; tall buildings collapse or have severe structural deformations; some cars, trucks, and train cars can be thrown approximately 1 mile (1.6 km).

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

Previous Occurrences

Thunderstorms are almost a daily occurrence during the summer in Hinsdale County, especially in the months of June through early September that coincide with the North American monsoon. The County's varied topography and unique weather patterns combine to produce severe thunderstorm activity that may include hail or high winds.

NOAA's National Center for Environmental Information (NCEI) Storm Events Database records 30 severe thunderstorm events (the search included funnel cloud, hail, heavy rain, high wind, lighting, strong wind, thunderstorm wind, and tornado) for the San Juan Mountain Region, four of which occurred in Hinsdale County in the past 69 years (1950 –July 2019). No hail events have been recorded but this does not mean they do not occur or have the possibility of occurring in the county.

Due to the varied topography in the County, which influences severe thunderstorm activity, information from two of closest weather stations with the most comprehensive data for the Hinsdale County planning area, the Lake City Weather Station (054734) and the Rio Grande Reservoir Weather Station (057050) are summarized below in the figures below.

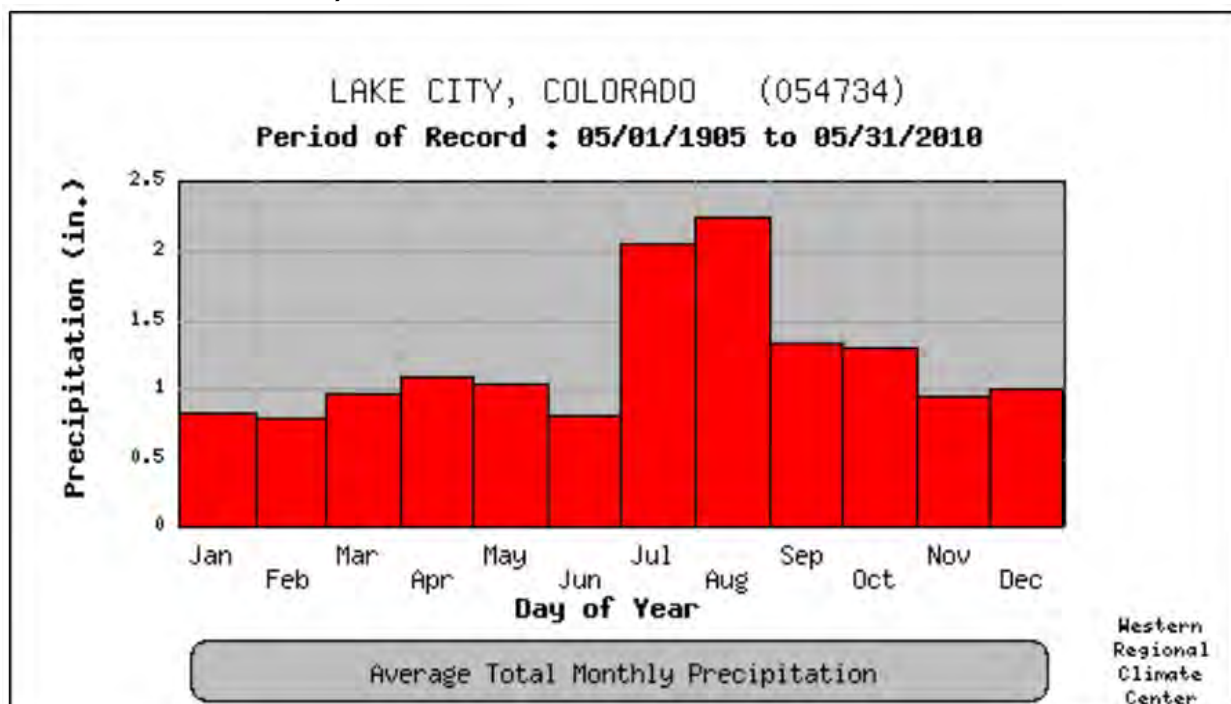


Thunderstorm activity is most likely to occur in the summer months but could also take place during severe winter storms. According to the HMPC during the March 2019 “Bomb Cyclone” event which impacted the entire state of Colorado, reports of thundersnow and lightning were made during the winter storm event.

Lake City Weather Station (Period of Record 1905 to 2010)

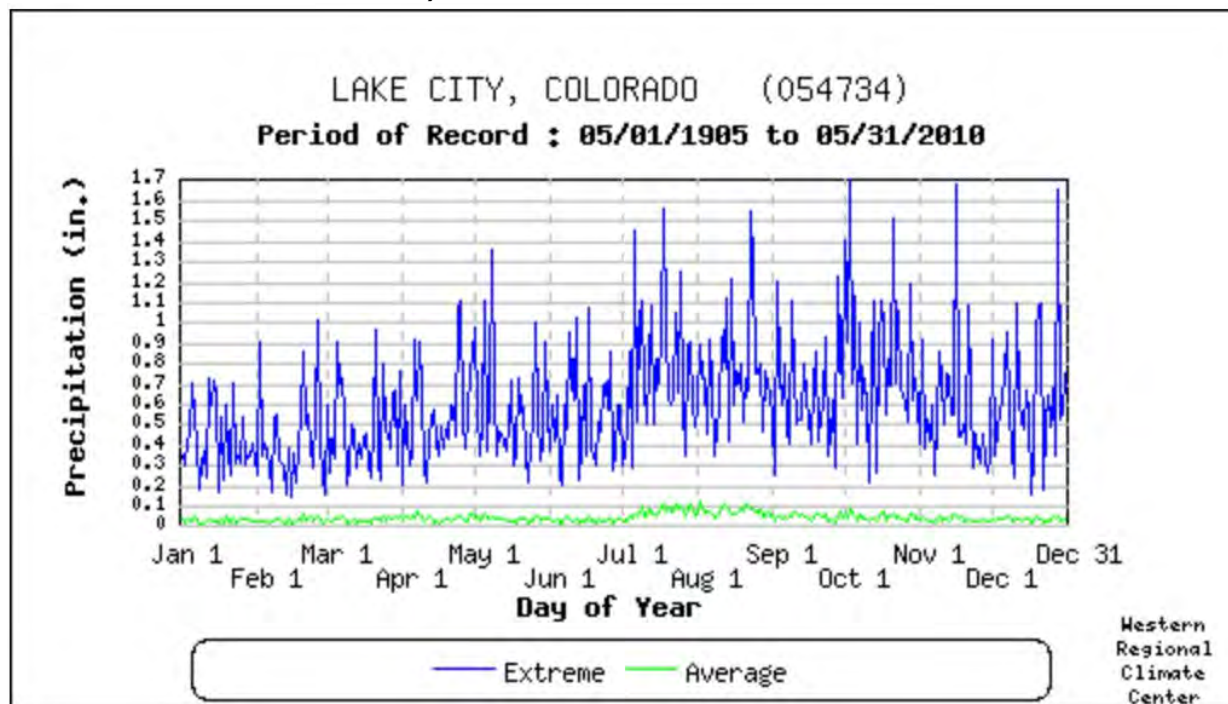
Average annual precipitation in the Lake City area is 14.24 inches per year. The highest recorded annual precipitation was 22.18 inches in 1957; the highest recorded precipitation for a 24-hour period in the summer months was 1.56 inches on July 18, 1996. The lowest recorded annual precipitation was 8.82 inches in 1976. The months of July and August have the highest total monthly precipitation.

Figure 4-34 Lake City Weather Station- Monthly Average Total Precipitation (Period of Record 1905 -2010)



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

Figure 4-35 Lake City Weather Station - Daily Precipitation Average and Extreme (Period of Record 1905-2010)



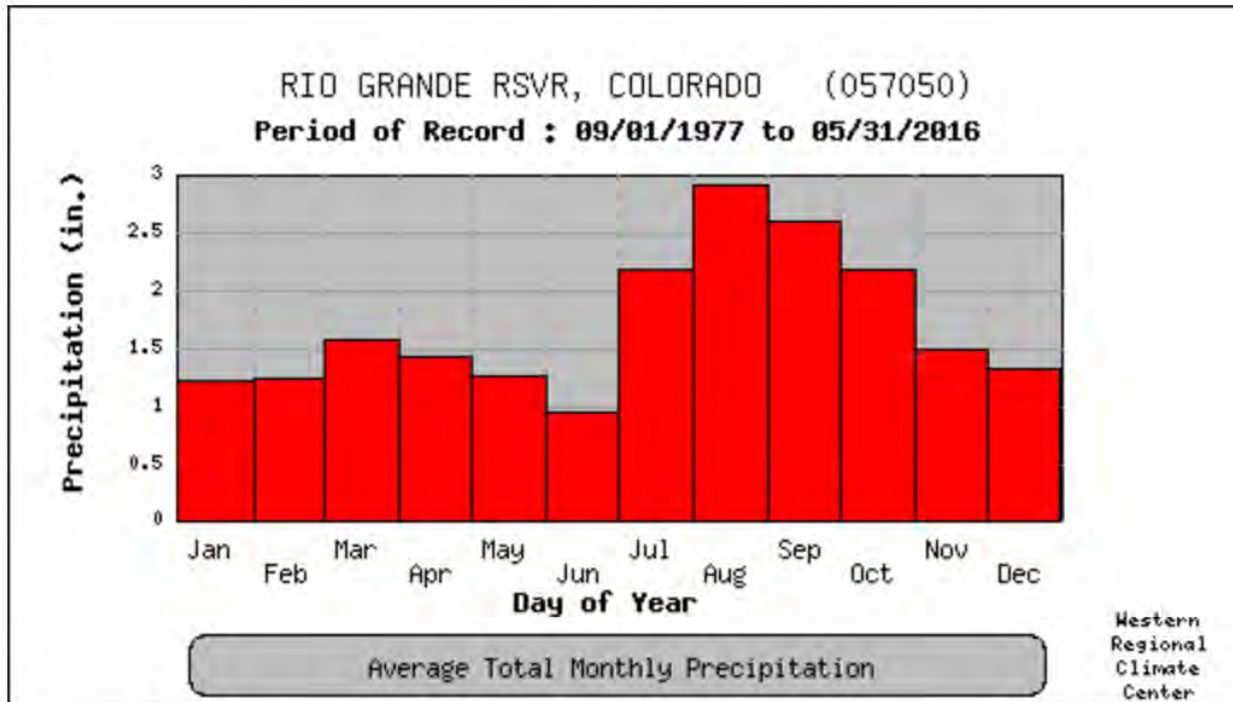
Source: Western Regional Climate Center, www.wrcc.dri.edu/

*Extreme is the greatest daily precipitation recorded for the day of the year. Average is the average of all daily precipitation recorded for the day of the year.

Rio Grande Reservoir Weather Station (Period of Record 1977-2016)

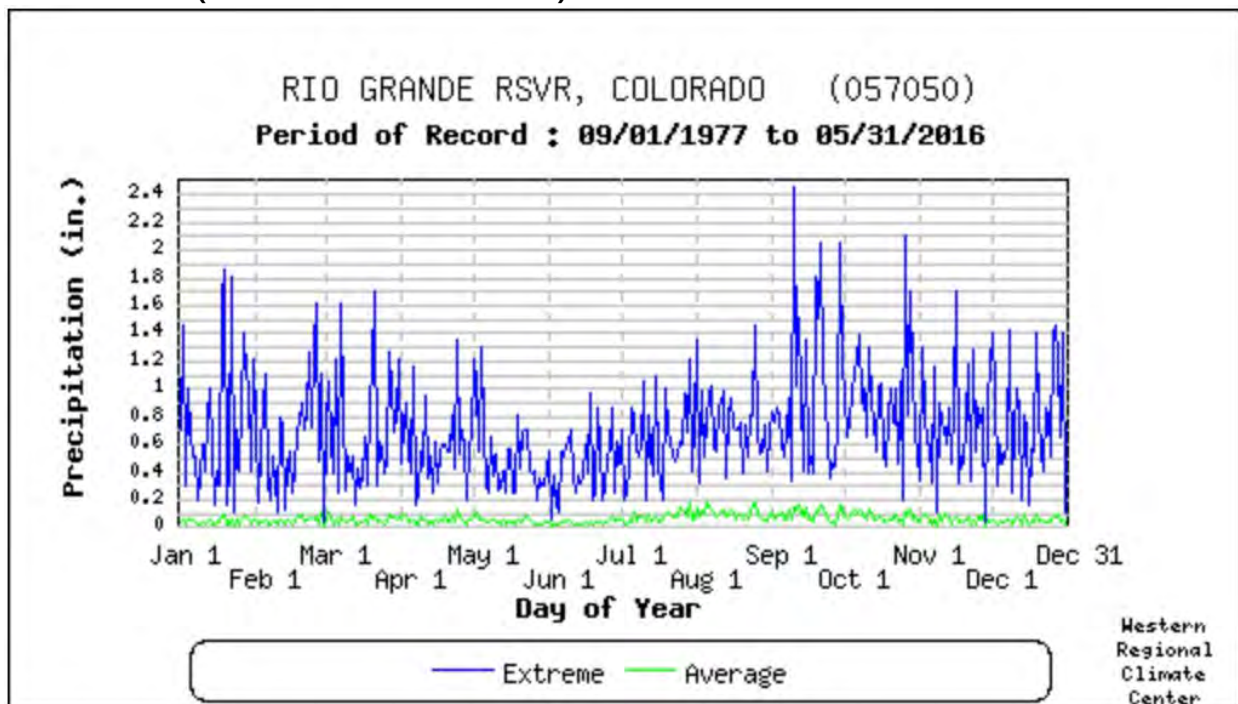
Average annual precipitation at the Rio Grande Reservoir area is 20.45 inches per year. The highest recorded annual precipitation was 32.69 inches in 1990; the highest recorded precipitation for a 24-hour period is 2.45 inches on September 10, 2003. The lowest recorded annual precipitation was 13.96 inches in 1995. Similar to the Lake City area, this portion of the County (south of Lake City) also receives the most precipitation in the month of August, although unlike Lake City this area continues to experience heavy rain events throughout the fall months of September, and October. The follow figures depict the monthly average precipitation and daily extremes.

Figure 4-36 Rio Grande Reservoir Weather Station – Monthly Average Total Precipitation (Period of Record 1977-2016)



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

Figure 4-37 Rio Grande Reservoir Weather Station - Daily Precipitation Average and Extreme (Period of Record 1977-2016)



Source: Western Regional Climate Center, www.wrcc.dri.edu/ *Extreme is the greatest daily precipitation recorded for the day of the year. Average is the average of all daily precipitation recorded for the day of the year.

The following is a summary of the records collected from the NCEI Storm Events Database for severe thunderstorm events specific to Hinsdale County.

- **August 16, 2005 (Thunderstorm Event)** - Strong winds toppled several large cottonwood trees, causing extensive damage to a residence. Approximately 70 percent of the roof to the residence was caved in. \$50,000 in property damage resulted from the severe thunderstorm event.
- **June 30, 2011 (Thunderstorm Event)** - A vigorous Pacific trough moved across the region and produced strong thunderstorms and areas of heavy rainfall across western Colorado. Thunderstorm winds gusts estimated up to 60 mph broke off tree limbs up to 3 inches in diameter at Lake City.
- **July 11, 2014 (Lightning Event)** - Early season subtropical moisture and daytime heating resulted in scattered afternoon thunderstorms over the mountains of southwest Colorado. The event resulted in two injuries when two ultramarathon runners from Canada were struck by lightning on Handies Peak at about the 14,050 foot level while competing in the 100-mile Hardrock Endurance Run. Both men incurred minor injuries. The headlamp of one runner exploded when struck by the lightning. This event also resulted in \$300 in property damages.
- **July 27, 2017 (Heavy Rain Event)** - Subtropical moisture remained across the area and produced some thunderstorms with heavy rainfall. Heavy rainfall resulted in a rockslide across Highway 30 between Highway 149 and Lake San Cristobal.
- **August 3, 2019 (Heavy Rain Event)** - Heavy rains resulted in a mudslide on the upper sections of CR 30 that isolated approximately 60 people in OHV and four-wheel drive vehicles, requiring evacuation by local first responders.

Probability of Future Occurrences

Highly Likely – Thunderstorms that produce lighting, heavy rain and high winds are well-documented seasonal occurrences that will continue to occur annually in the Hinsdale County.

Climate Change Considerations

It is difficult at this point in time to summarize the effects climate change may have on these hazards. However, as average temperatures increase over time, this generally will result in higher extreme temperatures. More warming in the atmosphere can trigger climate changes, which could result in more frequent extreme weather events. Much of the U.S. has already experienced prolonged periods of heavy downpours and severe flooding as a result of more extreme heavy rain and thunderstorm events.

Vulnerability

General Property

Severe thunderstorm events in Hinsdale County are seasonal events that are most likely to occur in the summer months of June, July and August. These thunderstorm events can include significant precipitation as well as high winds, and lighting. These storms have resulted in injury and damages to property in Lake City in the past. Lightning in particular can cause deaths, injuries, and property damage, including damage to buildings, communications systems, power lines, and electrical systems. Lightning strikes cause intense but localized damage. Structural fires, localized damage to buildings, damage to electrical powerlines and communications outages are typical consequences of a lightning strike. High winds in the planning area often result in downing of trees and damage to properties as a result. Given the nature of these types of storms, the entire County is potentially at risk.



People

Exposure is the greatest danger to people from severe thunderstorms. People can be hit by lightning, pelted by hail, and caught in rising waters due to heavy rain. Tourists and those enjoying the outdoors who are not familiar with the severe weather events in the County are particularly at risk to thunderstorms in Hinsdale and the associated hazards of precipitation and the increased risk of being struck by lightning or being stranded by debris flows, floods and rockslides triggered by thunderstorms. The amount of OHV traffic on the Alpine Loop increases this exposure of people during the summer months.

Aspects of the population who rely on constant, uninterrupted electrical supplies may have a greater, indirect vulnerability to lightning. As a group, the elderly or disabled, especially those with home health care services relying on rely heavily on an uninterrupted source of electricity. Resident populations in nursing homes, residential facilities, or other special needs housing may also be vulnerable if electrical outages are prolonged. If they do not have a back-up power source, rural residents and agricultural operations reliant on electricity for heating, cooling, and water supplies are also especially vulnerable to power outages.

The HMPC noted that cottonwood trees have been downed by wind events in the past and have posed a risk to people as well as transportation infrastructure. During high wind events recess is often cancelled and school yards are closed due to the risk of downed trees to the students.

Critical Facilities and Infrastructure

Because of the unpredictability of severe thunderstorm events strength and path, most critical infrastructure that is above ground is equally exposed to the storm's impacts. Due to the random nature of these hazards, a more specific risk assessment was not conducted for this plan. During the 2019 Planning Process the HMPC noted that the Hill 71 and Roundtop communications infrastructure has been impacted by lightning in the past.

Economy

Economic impact of a severe thunderstorm is typically short term. Lightning and high wind events can cause power outages and fires. Generally, long-term economic impacts center more around hazards that cascade from a severe thunderstorm, including wildfires ignited by lightning, and flooding (refer to the Wildfire and Flood sections). In general, all severe thunderstorms pose a risk to the tourism economy in the county. These events can disrupt travel into and out of all areas of the county and create perilous conditions for residents, tourists and nature alike.

Historic, Cultural, and Natural Resources

Severe thunderstorms are a natural environmental process. Environmental impacts include the sparking of potentially destructive wildfires by lightning and localized flattening of plants by high wind. The HMPC noted in the 2019 planning process that downed trees are a common occurrence during high wind events. As a natural process, the impacts of most severe thunderstorms by themselves are part of the overall natural cycle and do not cause long-term consequential damage.

Future Development

New critical facilities, such as communication towers should be built to withstand heavy rain, wind, and lightning damage. Future development projects should consider severe thunderstorm hazards at the



planning, engineering and architectural design stage with the goal of reducing vulnerability. Development trends in the County are not expected to increase overall vulnerability to the hazard but all development will be affected by severe thunderstorm events and any population growth will increase potential exposure to hazards such as severe thunderstorms.

Risk Summary

The overall impact to the community from severe weather events associated with severe thunderstorms could include:

- *Effects on people:* Individuals outside during a severe thunderstorm, in particular tourists and OHV enthusiasts, are most vulnerable to the effects of a thunderstorm especially lightning. The elderly and those dependent on constant electricity are also at risk during these events if power outages were to occur for an extended period of time.
- *Effects on property:* Past severe thunderstorm events have resulted in significant damage to homes and property in Lake City after high winds toppled trees onto homes. Lightning poses the same risk to property in addition to the risk of causing a structural of wildfire.
- *Effects on economy:* Economic impact of a severe thunderstorm is typically short term. The tourism economy is most vulnerable as these events can disrupt travel into and out of all areas of the county and create perilous conditions for residents and tourists alike.
- *Effects on critical facilities and infrastructure:* Because of the unpredictability of severe thunderstorm events strength and path, most critical infrastructure that is above ground is equally exposed to the storm's impacts.
- *Related hazards:* Wildfire, Flood, Landslide, Dam Failure

Table 4-39 Hazard Risk Summary – Severe Thunderstorm

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Hinsdale County	Extensive	Highly Likely	Limited	Medium
Lake City	Extensive	Highly Likely	Limited	Medium

4.3.8 Severe Winter Storms

Hazard/Problem Definition

Winter storms can include heavy snow, ice, and blizzard conditions. 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. Severe winter storms can cause homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on communities.

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.

Winter storms in Hinsdale County, including intense 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 also impact budgets significantly. Heavy snowfall during winter can also lead to flooding or landslides during the spring if the area snowpack melts too quickly. Avalanche danger is greatly increased during and immediately after heavy snowfall.

Location

Extensive - The entire County is susceptible to severe winter storms.

Extent (Magnitude/Severity)

Overall, severe winter storm impacts could be limited, but the potential for heavy snow and blizzard events as defined by the National Weather Service are possible. County residents take the weather in stride as part of mountain living. Most property damages with winter storms are related to the heavy snow loads and vehicle accidents. The highest risk will be to travelers that attempt to drive during adverse conditions. Economic impacts occur because of power outages and closures of Highway 149 for snow removal and avalanche control, leaving residents and visitors stranded as well as interrupting the transport of supplies and services into the area for an extended period.

Previous Occurrences

Several major winter storms and blizzards have occurred in the planning area over the past several decades. Profiles of some of the more severe storms were obtained from the NCEI Storm Events Database. According to the Database there have been 894 severe winter storm events (includes blizzard, heavy snow, winter storm and winter weather events) between January 1, 1950 and May 1, 2019 that have impacted Hinsdale County. The following table summarizes the events.

Table 4-40 NCEI Severe Winter Storm Event Reports for Hinsdale County, 1950-2019*

Event Type	# of Events	Property Damage (\$)	Crop Damage (\$)	Deaths	Injuries
Winter Storm	325	5,000	0	0	0
Winter Weather	470	30,000	0	0	0
Heavy Snow	81	0	0	0	0
Blizzard	18	10,000	0	0	0
Totals	894	\$45,000	0	0	0

Source: National Center for Environmental Information Storm Events Database, www.ncdc.noaa.gov/stormevents/

*Hazards with wide extents have losses which reflect larger zones that extend beyond Hinsdale County

The event of record for winter storm events occurred in the 1983-1984 winter season. This winter is still considered to have contained the heaviest snow falls in recent history with over 3 feet of snow accumulation in a one and a half days in addition to high winds producing 5 to 6-foot snow drifts. The



previous County LHMP reported that Highway 149 North remained closed for three days between Powderhorn and Highway 50. The 2018-2019 winter season was another of epic proportions. Intense storms lead to an avalanche cycle in March of 2019 that damaged homes in the area (see Avalanche hazard profile). The heavy snowpack resulted in flood concerns in the spring.

The following data was obtained from the Western Regional Climate Center and two weather stations in the Hinsdale County area: Lake City and Rio Grande Reservoir. Table 4-41 contains snowfall and snow depth summaries for the two stations. Figure 4-38 through Figure 4-41 show Lake City and Rio Grande Reservoir stations daily snowfall and snow depth averages and extremes.

Table 4-41 Hinsdale County Snowfall and Snow depth Summaries

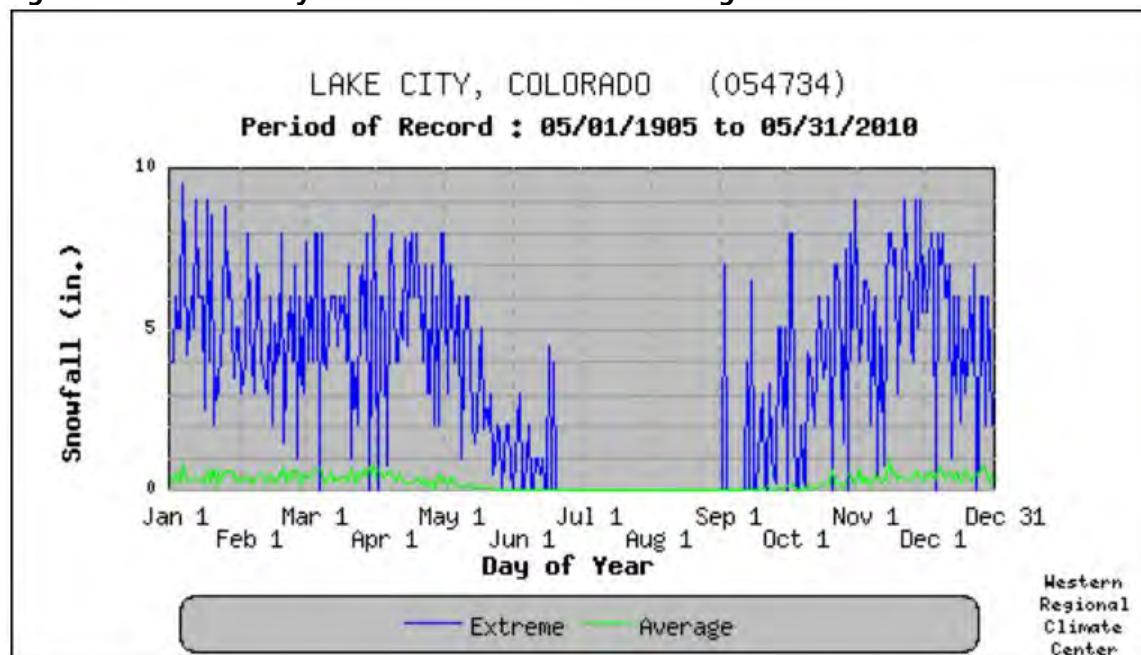
Station	Average Annual Total Snowfall (in.)	Average Snow Depth (in.)	Snowiest Month/Average Snowfall (in)	Highest Monthly Snowfall (in.)	Highest Seasonal Snowfall (in.)	Coldest Recorded Temperature (F)
Lake City ¹	83.5	3	December/13.7	60 Dec. 1973	141.5 1957	-38 Jan. 4, 1974
Rio Grande Reservoir ²	127.9	4	February/23.3	92 Feb. 1987	225.5 1987	-46 Dec. 8, 1978

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

¹Period of Record May 1, 1905 to May 31, 2010

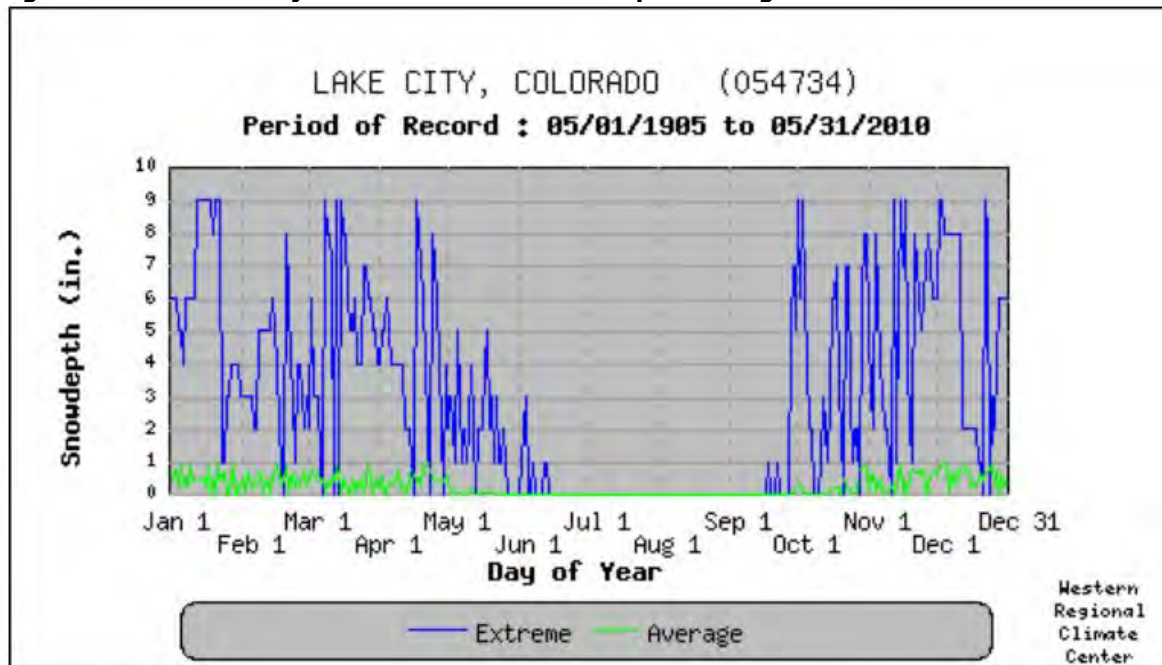
² Period of Record September 1, 1977 to May 31, 2016

Figure 4-38 Lake City Weather Station Snowfall Average and Extreme 1905-2010



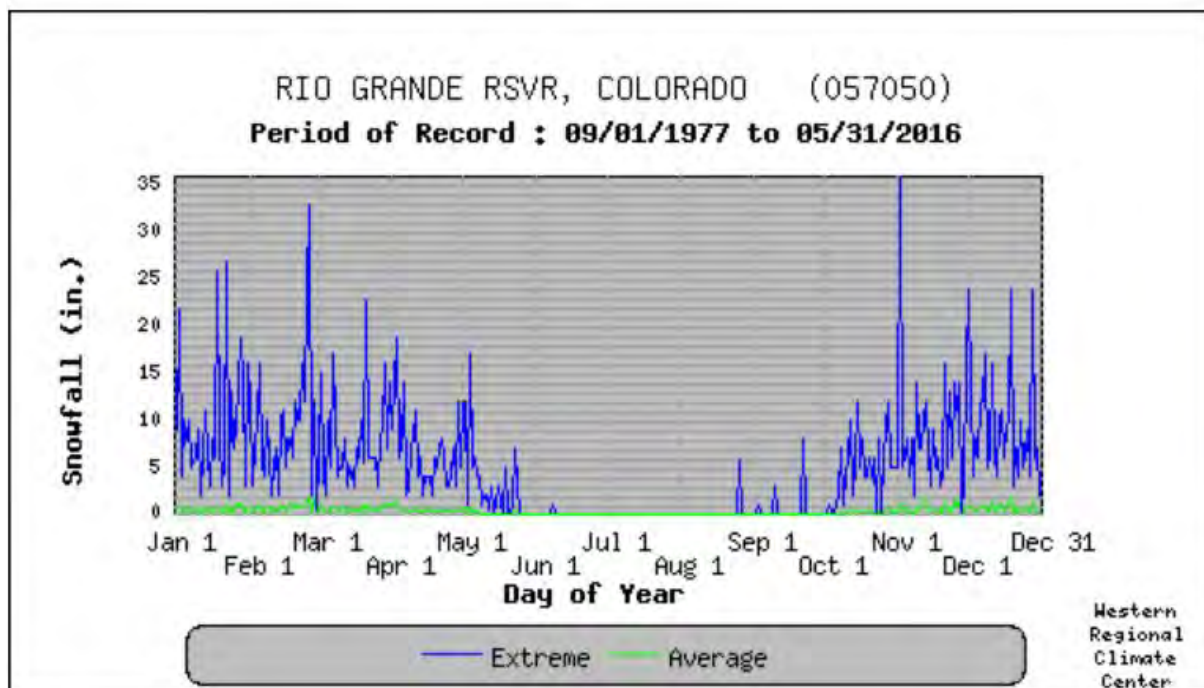
Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 4-39 Lake City Weather Station Snow Depth Average and Extreme 1905-2010



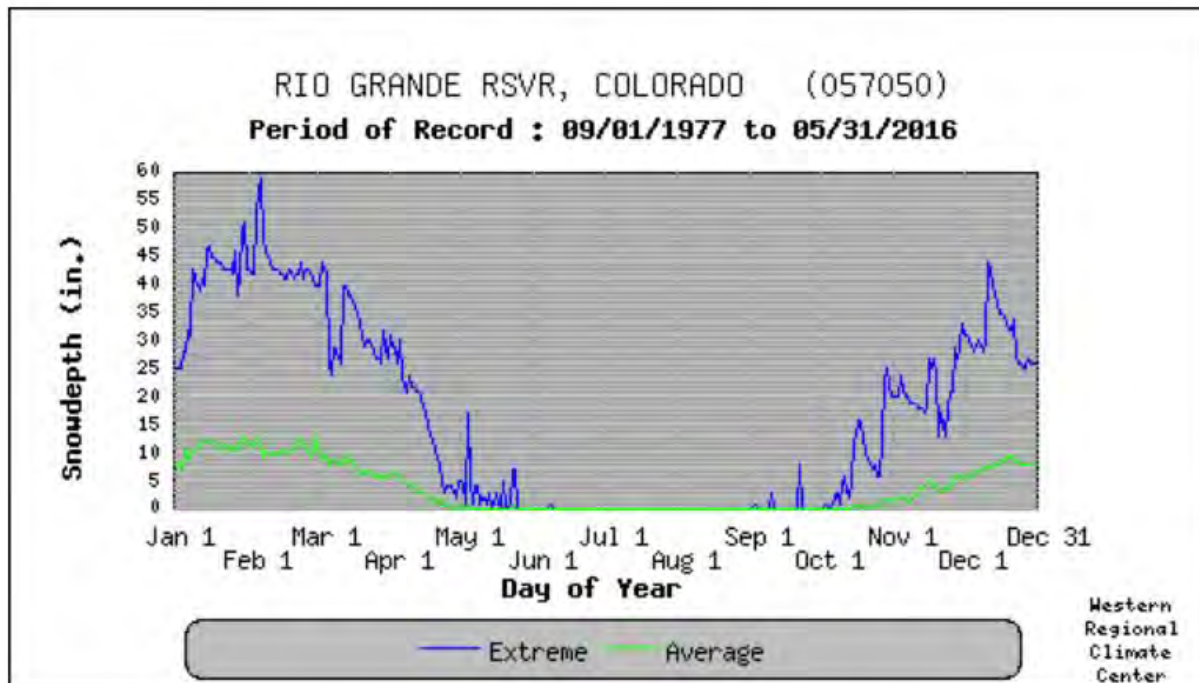
Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 4-40 Rio Grande Reservoir Weather Station Snowfall Average and Extreme 1977-2016



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

Figure 4-41 Rio Grande Reservoir Weather Station Snowdepth Average and Extreme 1977-2016



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

Probability of Future Occurrences

More damaging severe storms may have a slightly lower frequency of occurrence. Based on the data presented above, it is likely that a damaging winter storm will occur. Based on the data presented above, in the past 69 years there have been 894 winter storm events that have occurred within the planning area. The HMPC estimates that severe winter storms are **highly likely** to occur in any given year.

Climate Change Considerations

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

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

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

Dust-on-snow causes increased snowmelt because dust is darker than snow it absorbs more sunlight causing the snow underneath to heat up more rapidly. This is an emerging factor that could lead to

substantial long-term reductions in Colorado's seasonal snow cover. The Center for Snow and Avalanche Studies (CSAS), operates the Colorado Dust-on-Snow program to study the effects of dust on Colorado's snowpack. The program has CSAS sensors at 11 mountain pass locations throughout the state to monitor the presence or absence of dust layers, including Spring Creek Pass located in Hinsdale County.

Vulnerability

The threat to public safety is typically the greatest concern when it comes to impacts of winter storms. But these storms can also impact the local economy by disrupting transportation and commercial activities. Winter storms are occasionally severe enough to overwhelm snow removal efforts, transportation, livestock management, and business and commercial activities. Travelers on highways in Hinsdale County, especially along the remote stretches of road, can become stranded, requiring search and rescue assistance and shelter provisions. The County can experience high winds and drifting snow during winter storms that can occasionally isolate individuals, particularly tourists that may not be familiar with winter weather in the San Juan Mountains. Winter storms also contribute directly to avalanche hazards and extreme cold temperatures. Limited phone and cell phone service in parts of the County may mean that emergency reporting may be difficult or impossible during severe winter storm events.

General Property

Structural losses to buildings are possible and structural damage from winter storms in Colorado have resulted from severe snow loads on rooftops. Fall and spring snowstorms generally bring heavy and wet snow which impacts utilities structures and even trees. As noted in the previous County LHMP, structures in the County are required to be constructed to carry snow loads and to withstand high winds. Despite this, older buildings are more at risk, as are buildings with large flat rooftops (often found in public buildings such as schools). According to the Lake City Silver World Newspaper (March 22, 2019) heavy snow during the 1983-84 winter led to the collapse of the Swanson House building at the corner of 3rd and Silver Street in Lake City. Typically, property damage is minor with damages to stove pipes or outbuildings.

Vulnerability is influenced both by architecture and type of construction material and should be assessed on a building-by-building basis. "Roof avalanches" are a possibility after heavy snowfall events although it is uncommon, it has occurred in other mountain communities in Colorado.

People

The threat to public safety is typically the greatest concern when it comes to impacts of winter storms. While virtually all aspects of the population are vulnerable to the potential indirect impacts of a winter storm, others may be more vulnerable, such as the elderly, particularly if there is a loss of electrical power. According to the HMPC, casualties as a result of extreme cold temperatures in the past have generally been the result of intoxication and exposure and otherwise the impacts on people have been minor.

The weight of heavy continued snowfall and/or ice accumulating on power lines often brings them to the ground causing service disruptions for thousands of customers. This can cause a loss of community water and sewer services, as well as the supply of gasoline, as these services almost always require electrical pumps. In addition, prolonged power outages can mean loss of food in grocery stores and other facilities such as restaurants.



The region can experience high winds and drifting snow during winter storms that can occasionally isolate individuals and entire communities and lead to serious damage to infrastructure. Travelers on Highway 149 in the planning area, or particularly along the many remote stretches of road, can become stranded, requiring search and rescue assistance and shelter provisions. Persons that choose to live in these areas are generally self-sufficient or should be prepared to be self-sufficient for at least 72 hours, as government and emergency services may be limited during a severe winter storm.

Critical Facilities and Infrastructure

Roads are especially susceptible to the effects of a winter storm, which can temporarily hinder transportation and require resources for snow removal. Highway 149 is the only through road in the County and closure of the highway would leave Lake City isolated from emergency services. Power disruptions have also occurred during storm events. Power supply for Hinsdale County is from the Gunnison County Electrical cooperatives/Tri-state high voltage transmission line coming into the Valley from the North. The transmission line is above the Valley floor on the east side of the Valley and is considered vulnerable to severe winter storms. The HMPC noted during the 2019 planning process that the biggest consequences from a severe winter storm is for an avalanche to occur. In past events County Road 30 and 20 have experienced notable impacts due to avalanche events. Keeping road access clear and safe has proved to be challenging at times.

During the 2019 planning process CDOT noted that they are considering adding a snow fence on Slumgullion Pass to mitigate the impacts of a severe winter storm. The HMPC noted this area is more susceptible to impacts of winter storms due to fuel breaks from wildfire mitigation and the result of clearing beetle killed trees.

Economy

Closure of Highway 149 during winter storms would could temporarily isolate Lake City and further isolate remote areas of the County. Depending on the length of the closure it could also hinder the local economy which is dependent on tourism and out of county visitors.

Historic, Cultural, and Natural Resources

Natural resources may be damaged by the severe winter weather, including broken trees and death of wildlife. Unseasonable storms may damage or kill plant and wildlife, which may impact natural food chains until the next growing seasons. Most of these impacts would be short-term. In recent years local volunteers have augmented the efforts of ranchers and State Parks and Wildlife personnel to reduce herd mortality through emergency feeding programs. As noted previously, older, historic buildings could potentially be more vulnerable to roof and structural damage from heavy snow.

Future Development

Future buildings that conform to local building codes should be able to withstand snow loads from severe winter storms. Given building and population trends in the planning area, it is not anticipated that more persons will be exposed to the winter storm hazard in the future.

Risk Summary

- Winter storms often bring heavy snow and sometimes blizzard conditions to Hinsdale County.



- The 1983-84 winter season is the heaviest snowfall on record for the planning area; 2018-19, 1978-79 and 1952 were also notable winters for snowfall.
- *Effects on people:* Severe winter weather can isolate residents and travelers by closing roads into and out of the County.
- *Effects on property:* Heavy snow can lead to limited structural damage. Structures in the County are required to be constructed to withstand snow loads and high winds.
- *Effects on economy:* Closure of Highway 149 could further isolate remote areas of the County and prevent tourists from visiting the County.
- *Effects on critical facilities and infrastructure:* Power outages are possible in severe winter storms.
- *Related Hazards:* Avalanche, Flood

Table 4-42 Severe Winter Storm Risk Summary

Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Hinsdale County	Extensive	Highly Likely	Limited	High
Lake City	Extensive	Highly Likely	Limited	High

4.3.9 Wildfires

Hazard/Problem Definition

A wildfire is an uncontrolled fire spreading through vegetative fuels, posing danger and destruction to property. While wildfires are often the direct result of lightning strikes, many are caused by powerlines or mechanical equipment, or are the result of human activities like debris burns, carelessness, or arson. Wildfires often start in undeveloped areas and public land areas, such as state and national forest lands, but can spread to urban areas where structures and other human development are more concentrated. The predominant dangers from wildfires are:

- 1) Injury or loss of life to people in the affected area; and
- 2) The destruction of vegetation, property, wildlife.

Communities throughout Colorado are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildfire risk is predominantly associated with wildland-urban interface (WUI) areas, a general term that applies to development adjacent to landscapes that support wildfire. However, significant wildfires can also occur in heavily populated areas.

Hinsdale County is exposed to a variety of wildfire hazard conditions based on fuels, topography, weather, and human behavior. Wildlands need to burn periodically to naturally maintain viable environments. Fuel maintenance (controlled burns, mowing, cattle grazing and other means) is a necessary replacement to uncontrolled wildland fires because of threats to human habitation. Development patterns in rural lands can reduce the ability to manage fuel and defend “values at risk.”

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.

- 1) **Fuel**—Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree



leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Also, to be considered as a fuel source are manmade structures, such as homes and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Fuel is the only factor that can be modified by humans.

- 2) **Topography**—An area's terrain and slopes affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement and types of vegetation throughout a hillside can also contribute to increased fire activity on slopes.
- 3) **Weather**—Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out fuels that feed wildfires, creating a situation where fuel will more readily ignite and burn more intensely. Thus, during periods of drought, the threat of wildfire increases. Wind is the most influential weather factor of the three and its influence can increase rates of spread regardless of temperature and relative humidity. On the other hand, lightning from severe weather events can spark natural wildfire and cause significant damage.

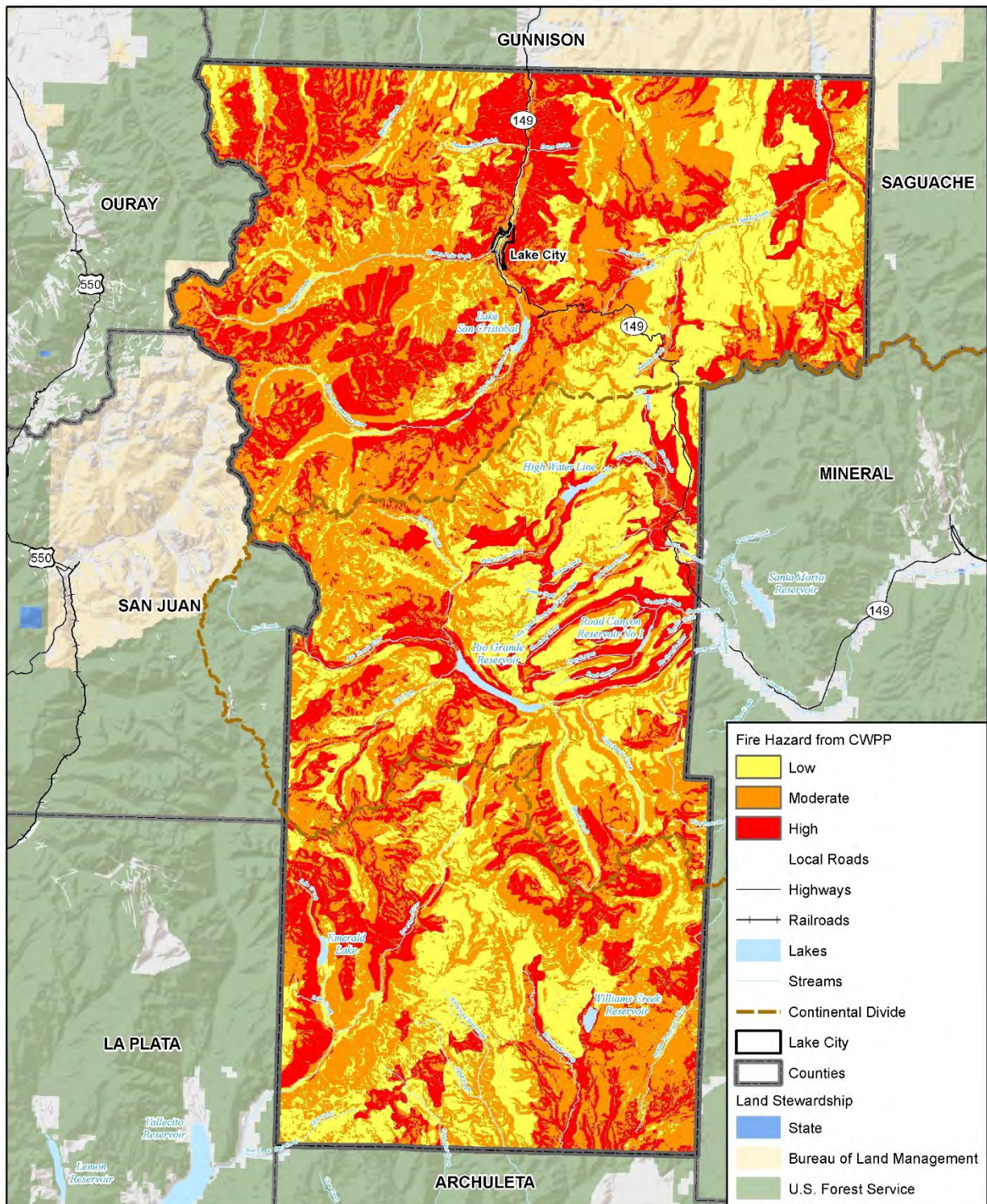
Location

The following figure shows the location of wildfire hazards across the County based on modeling done for the Hinsdale County Community Wildfire Protection Plan (CWPP).

The areas within the county that are subject to increased wildfire risks are generally those communities where urban development abuts non-maintained wildland fuels, resulting in a WUI. When residential development occurs within or adjacent to an area that has a high wildfire hazard severity, the ability of fire fighting forces to combat a fire may also be impaired. When residences are located in the vicinity of wildfire, typical firefighting techniques, such as the use of backfires, may not be feasible. Additionally, firefighting equipment and personnel may be used for structure protection, instead of being used to fight the fire. This results in the need for additional equipment to effectively minimize structural losses and to control the fire.

Figure 4-43 below displays the WUI areas in Hinsdale County, as was noted in Hinsdale County's most recent Community Wildfire Protection Plan (CWPP) from 2010. Per the figure, a total of 11 WUIs have been noted across the county, with most of the largest ones in terms of size (e.g. Lower Lake Fork, Upper Lake Fork) located in the vicinity of Lake City.

Figure 4-42 Wildfire Hazard in Hinsdale County Based on the CWPP

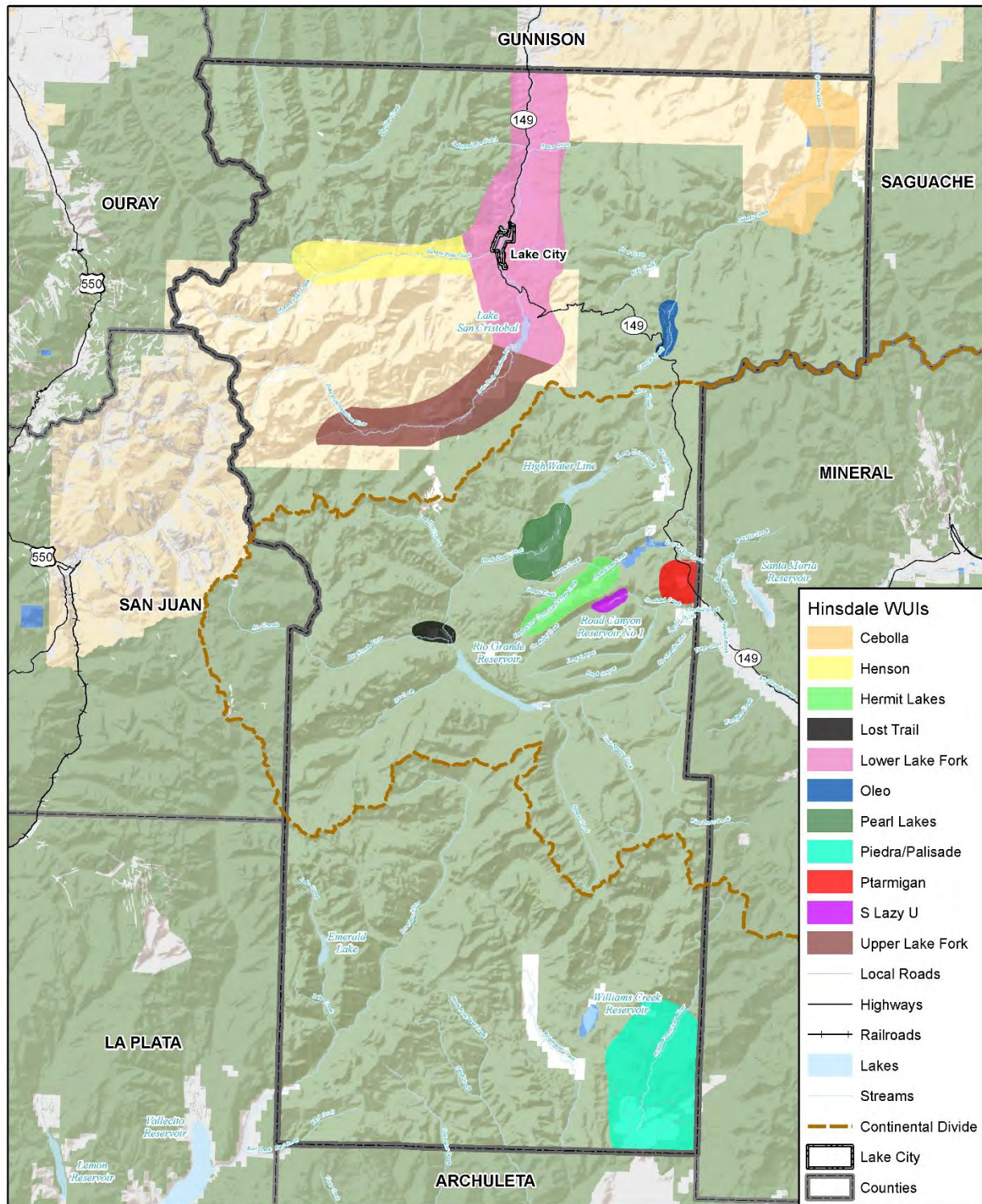


wood.
Map compiled 7/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, CO BLM,
San Luis Valley GIS/GPS Authority,
Hinsdale County CWPP

0 10 20 Miles



Figure 4-43 Wildland Urban Interface (WUI) Areas in Hinsdale County



wood.
Map compiled 6/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, CO-WRAP,
CO BLM, San Luis Valley GIS/GPS Authority

Extent (Magnitude/Severity)

Vegetation (or fuel) plays a major role in fire behavior and shaping fire hazard potential. Vegetation distribution throughout the county varies by location and topography. Fire behavior in brush fuel types produces higher flame lengths than that in grassland, although spread rates are typically slower. Fire behavior in forests is variable, depending on surface fuel conditions and the presence of ladder fuels.

Fuel loading in developed areas susceptible to wildfire becomes even more complex. The introduction of some ornamental plantings as landscaping and groundcover can dramatically increase the fire loading of a neighborhood. Gazebos, fencing, patios, decks and even the structures themselves add even more fuel. Once structures become involved in fire, the problem compounds as embers cast out thousands of feet onto combustible roofs well removed from the wildland area.

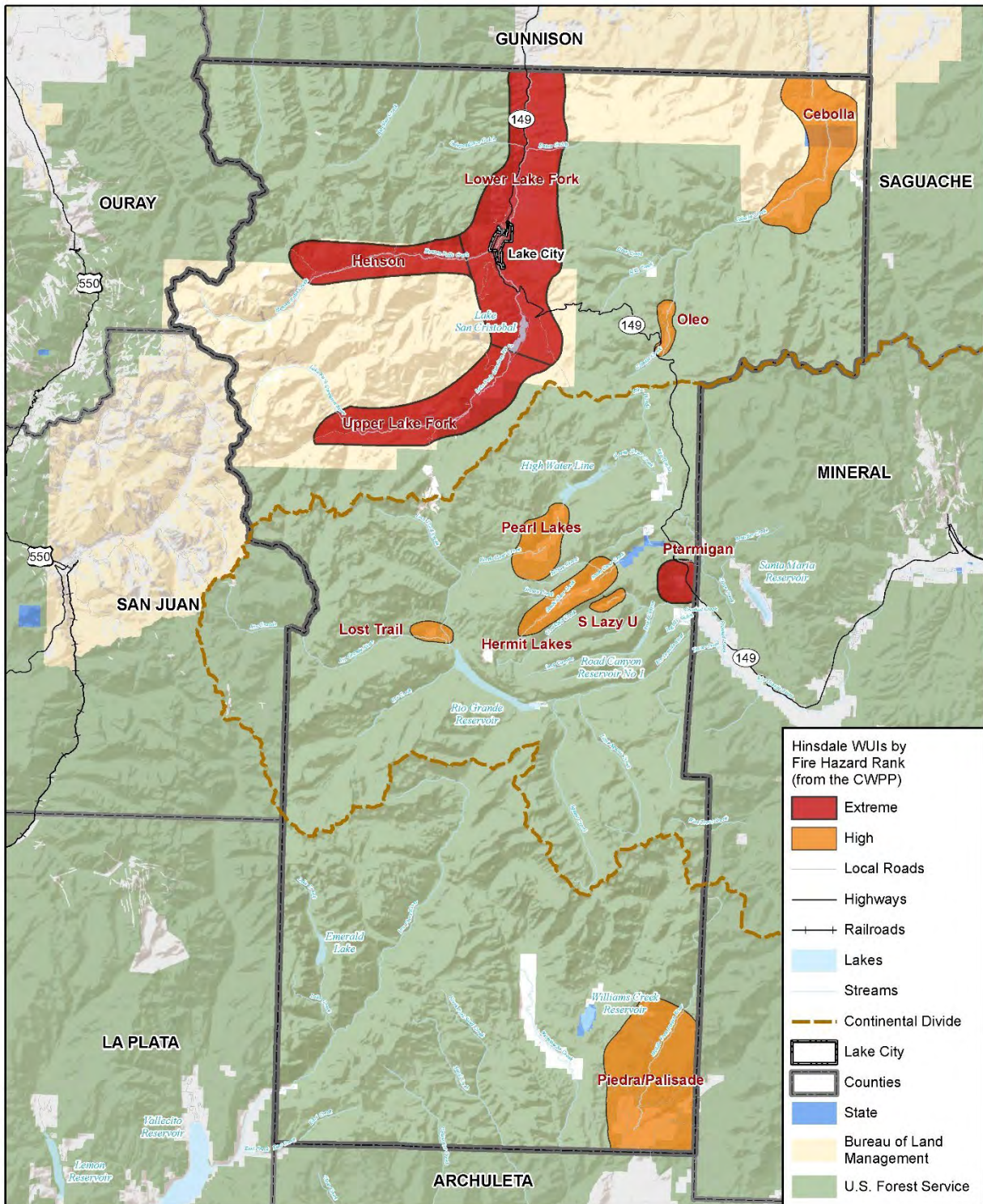
Steep terrain also plays a key role in the rate at which wildfires spread, as fires will normally burn much faster uphill. Generally, when the gradient of a slope doubles, the rate of spread of a fire will also double. Steep topography also channels air flow, thereby creating erratic wind patterns. Fire suppression in steep areas is also complicated by limited accessibility, and the effectiveness of firefighters and equipment are hampered by lack of access roads. Another factor that can increase the severity of wildfires in the county is areas with high percentages of dead trees.

Major wildland fires can completely destroy ground cover. If heavy rains follow a major fire, flash floods, heavy erosion, land subsidence and mudflows can occur. After a wildland fire passes through an area, the land is laid bare of its protective vegetation cover and is susceptible to excessive run-off and erosion from winter storms. The intense heat from the fire can also cause a chemical reaction in the soil that makes it less porous, and the fire can destroy the root systems of shrubs and grasses that aid in stabilizing slope material. These cascading effects can have ruinous impacts on people, structures, infrastructure, and agriculture. For more details on the extent and expected behavior of fires in the county see the county's Community Wildfire Protection Plan (CWPP), last updated in 2010.

The county's CWPP has mapped eleven (11) WUI communities and associated fire risk categories based on three classes: High, Very High, and Extreme Fire Hazard, portrayed in Figure 4-16. Note that a twelfth WUI (the River Hill/Rio Grande Box WUI) was ranked as falling under a Very High fire hazard category but is not displayed in the map below due to lack of spatial data and hence geographic coverage. As such, this WUI area is not analyzed further in this chapter. However, for context, this River Hill/Rio Grande Box community is located along the Rio Grande River near the boundary with Mineral County, between the Hermit Lakes, S Lazy U, and Ptarmigan WUI areas.

In Hinsdale County, the WUI areas addressed in the county's CWPP have been designated as having "High" or "Extreme" fire hazard risk, as displayed in Figure 4-44. These areas exhibit the combination of vegetative fuel, topography, and human proximity that contribute to serious fire hazard potential.

Figure 4-44 WUI Fire Hazard Ranking in Hinsdale County



wood.
Map compiled 7/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, CO-WRAP,
CO BLM, San Luis Valley GIS/GPS Authority

Previous Occurrences

Six (6) significant wildfires, or those which burned 1,000 or more acres of land, have been recorded in Hinsdale County since 2000 as shown in Figure 4-45. This map also identifies the locations and causes of wildfires that have occurred in recent decades. This equates to an average of one wildfire every three or four years. The six fires noted burned over 170,000 acres combined, and the average acreage burned in these recent wildfires is 28,400 acres. Earlier wildfires from before the year 2000 include the Penniston Park Fire, which occurred in 1978, and the Lost Trail Creek Fire, which took place in 1958. Table 4-43 summarizes the recent, large fires that have started or burned acreage (i.e. crossed the boundaries) in Hinsdale County since 2000.

The West Fork, Papoose, and Little Sand fires had the largest burned area footprint. All fires noted occurred in years of severe or extreme multi-year drought in Colorado and were caused by natural reasons, apart from the 2002 Missionary Ridge Fire which was caused by human activity and mostly burned in La Plata County.

Table 4-43 Hinsdale County's Fire History

Fire Name	Year of Occurrence	Fire Cause	Acres Burned
Missionary Ridge	2002	Human	81,852*
Bear Creek	2003	Natural	1,869
Vallecito	2012	Natural	1,400
Little Sand	2012	Natural	24,931
Papoose	2013	Natural	11,028
West Fork Complex**	2013	Natural	49,317
TOTAL			170,397

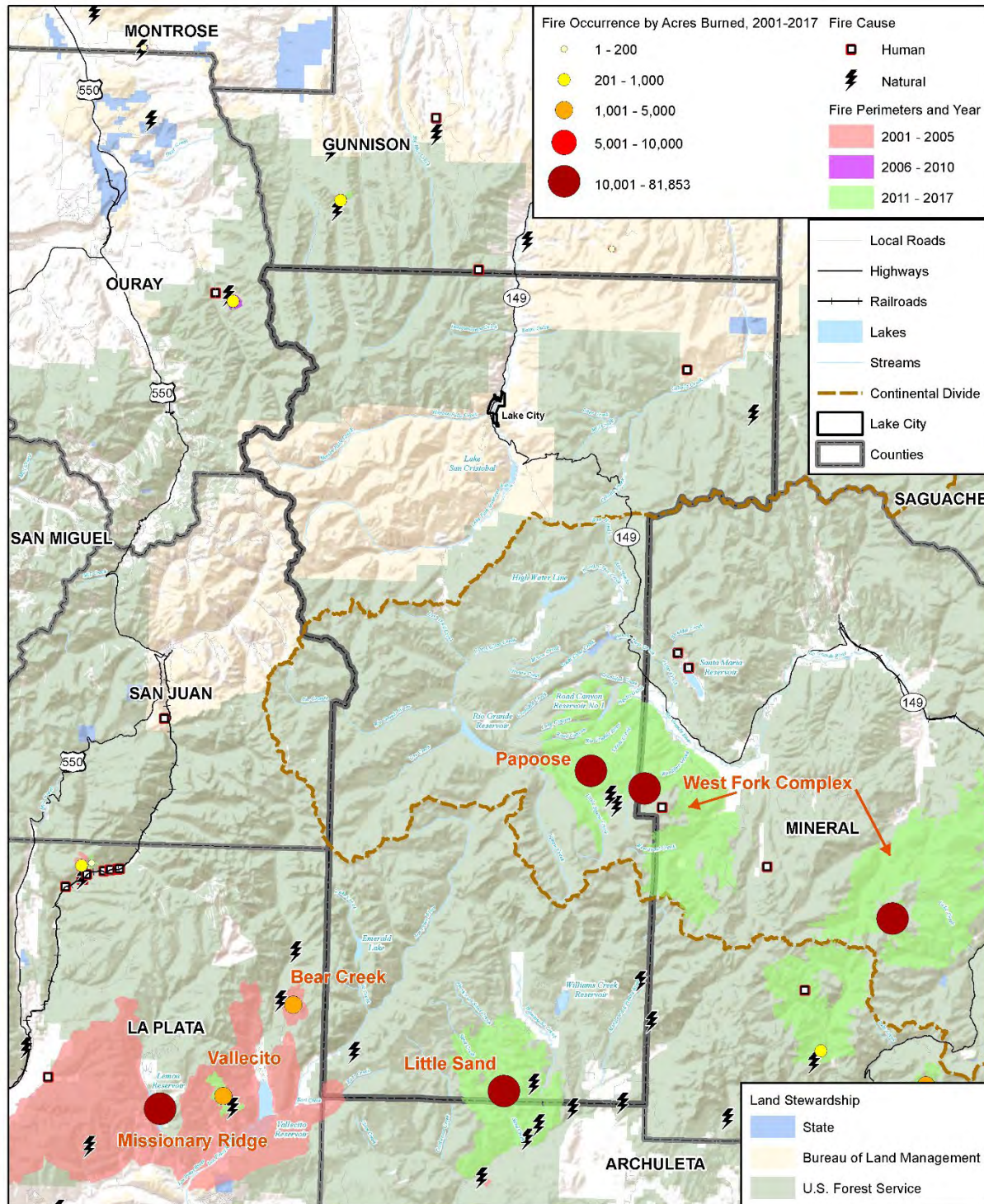
Source: Federal Wildland Fire Occurrence database, BIA, BLM, USFS, NPS from the GeoMAC portal

*most of this acreage was in La Plata County

** The West Fork Complex was the Papoose, the West Fork and Windy Gap Fires



Figure 4-45 Recent Fire History and Cause of Fires in Hinsdale, 2000-2019



wood.

Map compiled 5/2019;
intended for planning purposes only.
Data Source: US Census TIGER
Database, CO Open Data Portal, ESRI
World Terrain Basemap, USGS, BLM, BIA,
FS, NPS, Federal Wildland Fire Occurrence

0 10 20 Miles



Probability of Future Occurrences

Highly Likely. Based on the historical record there is a near 100% chance of wildfire occurrence in the next year, so that overall it is highly likely wildfire will happen at least once every year.

Climate Change Considerations

The effects of climate change have the potential to impact wildfire behavior, the frequency of ignitions, fire management, and fuel loads. Increasing temperatures may intensify wildfire threat and susceptibility to more frequent wildfires in the county. Forests are also sensitive to variable precipitation events, as drought in the southwest of Colorado in 2012 and 2018, for example, contributed to trees being more susceptible to pests and pathogens, in turn contributing to greater amounts of standing dead fuels.

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

Vulnerability

Hinsdale County vulnerability to wildfires is of significant concern, with some areas of the planning area being at greater risk than others as described further in this section. High fuel loads in the planning area along with geographical and topographical features create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. Even the relatively flat parts of the county are not immune to fire; hot and sometimes windy weather combined with dry vegetation and population clusters can result in an increase in the number of ignitions.

Hinsdale County's wildfire vulnerability is increased by development which encroaches into forested and annual grassland areas, typically referred to as the wildland-urban interface (though is rather limited given the county's low population totals and slow development). If or as development continues throughout the planning area, especially in the interface, the risk and vulnerability to wildfires will likely increase.

General Property

The historical and potential impacts of wildfire on property include crop loss, injury and death of livestock and pets, and damage to infrastructure, homes and other buildings located throughout the wildfire risk area, with greatest potential impact on property, buildings and infrastructure located within high and very high hazard zones including the WUI, and buildings and infrastructure located within forested lands, to include national forests and parks.

During the 2019 update of this plan, a GIS analysis of property exposure to WUI zones was performed, using the risk categorizations stated in the County's Community Wildfire Protection Plan, or CWPP (published in 2010). This analysis took into account the WUI zones, CWPP-provided structure counts, as well as Microsoft Footprints to the number and value of potential properties that may be at risk of



wildfires. An average residential structure value was first calculated based on Hinsdale County's Assessor's Office data, and that estimated value per residential parcel was then multiplied by the number of structures in each WUI, as indicated by the CWPP. Residential properties were assumed to make up the totals accounted for in the CWPP, as opposed to other types of parcels or properties. For more details on the specific datasets, building and structure analysis, and overall assets used and considered throughout this Hazard Mitigation Plan Update refer to the Assets Summary Section.

The GIS analysis which took into account the Microsoft Building Footprints indicates that 1,844 buildings fall within these WUI zones, with most of those (for a total of 1,354) being in the extreme fire risk WUI areas of Hinsdale County while 490 buildings fall in high risk WUI zones. Of these buildings, 548 are in Lake City, and 1,296 in the unincorporated portions. Based on the CWPP structure counts a total of 1,196 properties are located in the eleven WUI communities. An average residential value of \$188,280 was applied for the buildings in unincorporated areas of the county, and \$189,821 for residential buildings in Lake City for a total of \$225.2 million in residential value estimates countywide. In wildfires typically both the structure and all contents are lost. FEMA commonly estimates contents values at 50% of a residential structure value. This would add an estimated \$112.5 million in contents value, which when combined with structure values yields an estimate of \$ 337.7 million in overall exposure.

The specific WUI zones (neighborhoods/communities), buildings at risk, and loss estimates for the wildfire hazard are summarized in Table 4-44 and Table 4-45 below, with their respective data sources (whether from the Microsoft Building Footprint dataset or from the structure counts in the county's CWPP).

Table 4-44 Buildings in Wildfire Risk Exposure Zones (High and Extreme) in Hinsdale County

Wildfire Risk Category	Building Count from Microsoft Building Footprints	Structure Count from CWPP Assessment	Population at Risk (based on CWPP Structure Totals)
High	490	500	1,110
Extreme	1,354	696	1,545
TOTAL	1,844	1,196	2,655

Source: San Luis Valley GIS/GPS Authority, Hinsdale County CWPP, Microsoft Footprints/Open Street Map, US Census Bureau, Wood Plc analysis



Table 4-45 Buildings in WUI Zones by Community Name, Residential Values, and Loss Estimates

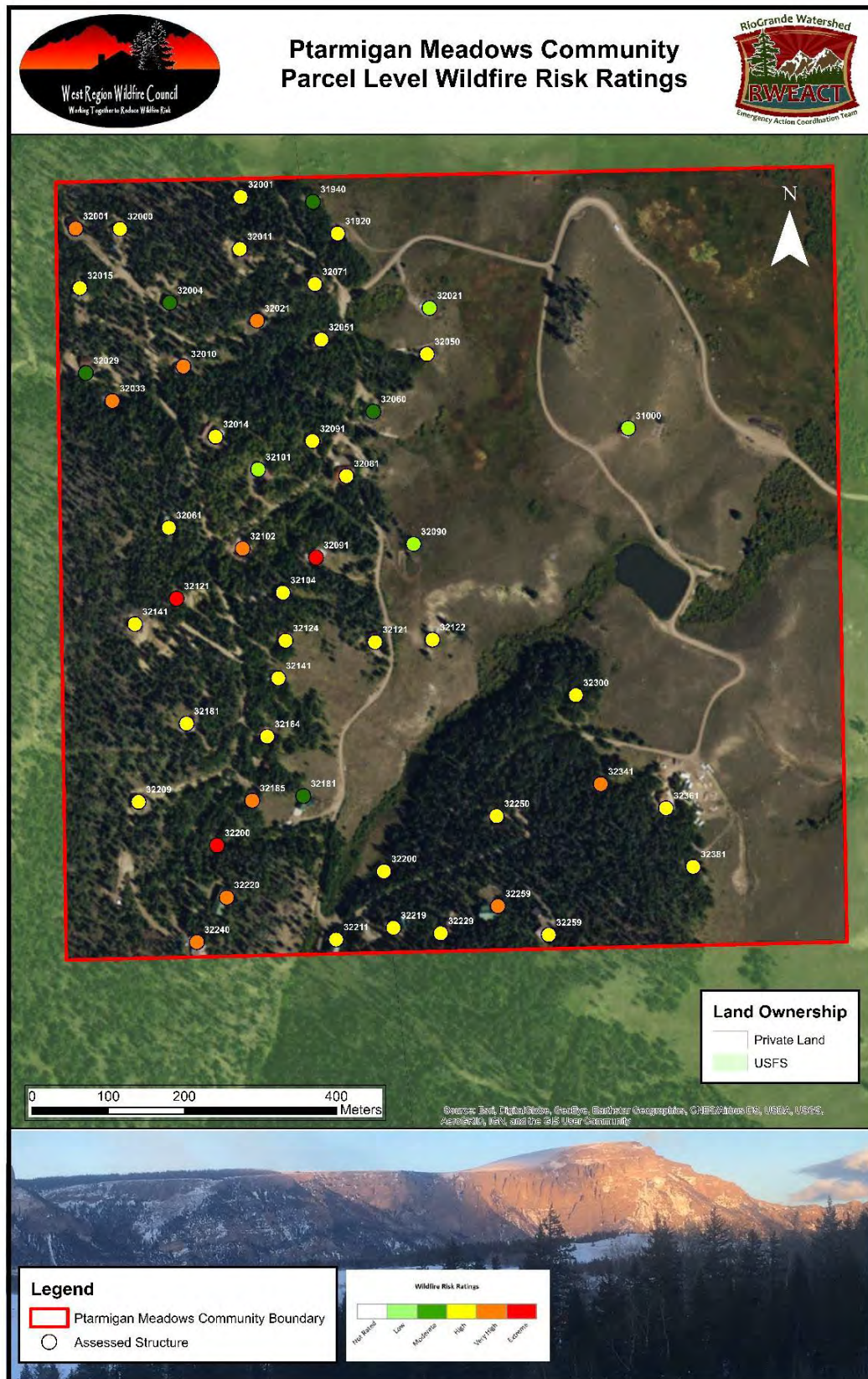
WUI Name	WUI Risk	Building Count from Microsoft Building Footprints	Structure Counts Stated in CWPP	Residential Structure Value Estimates from CWPP Structure Counts and Average Value Estimates	Content Values	Total Values	Loss Estimates (100% of the Residential Actual Value Estimates)	Population at Risk (based on CWPP Structure Totals)
Cebolla	High	64	93	\$17,509,998	\$8,754,999	\$26,264,997	\$26,264,997	206
Henson	Extreme	13	43	\$8,096,021	\$4,048,010	\$12,144,031	\$12,144,031	95
Hermit Lakes	High	115	70	\$13,179,569	\$6,589,784	\$19,769,353	\$19,769,353	155
Lost Trail	High	39	42	\$7,907,741	\$3,953,871	\$11,861,612	\$11,861,612	93
Lower Lake Fork	Extreme	1,175	493	\$92,821,818	\$46,410,909	\$139,232,727	\$139,232,727	1,094
Oleo	High	15	16	\$3,012,473	\$1,506,236	\$4,518,709	\$4,518,709	36
Pearl Lakes	High	89	70	\$13,179,569	\$6,589,784	\$19,769,353	\$19,769,353	155
Piedra/ Palisade	High	118	155	\$29,183,330	\$14,591,665	\$43,774,995	\$43,774,995	344
Ptarmigan	Extreme	48	52	\$9,790,537	\$4,895,268	\$14,685,805	\$14,685,805	115
S Lazy U	High	50	54	\$10,167,096	\$5,083,548	\$15,250,644	\$15,250,644	120
Upper Lake Fork	Extreme	118	108	\$20,334,191	\$10,167,096	\$30,501,287	\$30,501,287	240
TOTAL		1,844	1,196	\$225,182,342	\$112,591,171	\$337,773,513	\$337,773,513	2,655

Source: San Luis Valley GIS/GPS Authority, Hinsdale County CWPP, Microsoft Footprints/Open Street Map, US Census Bureau, Wood Plc analysis

In addition, the Ptarmigan Meadows community recently conducted a Community and Parcel Level Wildfire Risk Assessment (June 2018). The specific ratings of wildfire risk to the 52 total properties in the Ptarmigan community are summarized in terms of ratings ranging from Low to Extreme wildfire risk and can be seen in Figure 4-46 below. For more details on the assessment performed and results available, refer to the document as well as the West Region Wildfire Council website (<http://www.cowildfire.org/>).



Figure 4-46 Wildfire Risk Ratings for Buildings in the Ptarmigan Meadows Community



People

Wildland fires often lead to high risk for personal injury as well as potential loss of life to inhabitants of the fire area and firefighters. Wildfires in or near the WUI frequently require emergency evacuation and sheltering, often for many days. Population density can also change based on time of day and time of year, as people change their location and move to their job sites or educational facilities then return back home, or as tourism brings in additional populations seasonally. The potential for extended power outages as a result of a wildfire event could also have impacts on healthcare facilities and medically vulnerable individuals who are dependent on power for medical assessments and treatments. Other at-risk populations include those located in wildland recreational areas such as state and national parks and forests, particularly during warmer months.

Based on Table 4-44 and Table 4-45 above, an estimated 2,655 people could be at risk of these wildfire categories in the entire county (based on WUI structure counts from the CWPP). At risk population was estimated by multiplying the average number of persons living in each household in Hinsdale County (which is 2.22 per home) times the number of structures which were determined for each WUI based on the county's CWPP. The numbers may be slightly high, as many homes may be vacation or secondary properties which are not inhabited year-round but may have people residing during the high wildfire hazard months (spring, summer, early fall) that coincides with the high tourist season.

Critical Facilities and Infrastructure

Critical facilities are those community components that are most needed to withstand the impacts of disaster, as previously described in the Assets Summary Section. Wildfire impacts to critical facilities can include structural damage or destruction, risk to persons located within facilities, and interruption of facility operations and critical functions. GIS analysis consisted of an overlay of the critical facilities in the county with the wildfire hazard areas obtained from the county's current CWPP, published in 2010. This showed that 20 facilities are found in moderate wildfire hazard zones, while 2 are found in high wildfire hazard areas (for a total of 22 critical facilities exposed to medium or high fire hazards). Table 4-46 below summarizes these facilities for both wildfire hazard zones, while Figure 4-42 in earlier sections of this chapter shows the hazard zones in map form.

Table 4-46 Critical Facilities in Moderate and High Wildfire Risk Zones, per the CWPP

Table 4-10 Critical Facilities in Moderate and High Wildfire Risk Zones, per the CWP				
Wildfire Hazard Category	Jurisdiction	Critical Facility Name	Critical Facility Type	
Moderate: 20 CF	Lake City	Educational Media Foundation	FM Transmission Towers	
		Well House 1	Water Facility	
		Armory and Town Offices	Admin or Government Bldg.	
		Public Health	EMS Stations	
		Lake City Auto	HazMat	
	TOTAL			
	Unincorporated	Password, Inc	FM Transmission Towers	
		Hinsdale County Chamber of Commerce		
		AT&T Corp.	Microwave Service Towers	
		Town of Lake City		
		State of Colorado (Hill 71)		
		Town of Lake City 1	TV Analog Station	
		Town of Lake City 2	Transmitters	
		Tri-State Electric Substation	Electric Substations	
		OHV Pilot Program Route Endpoint	Miscellaneous/Other	
		Hinsdale County Road & Bridge Shop		
		Hinsdale County Waste Transfer Station	Wastewater Treatment Plant	
		Lake City Communication Tower (Round Top)	Communication Towers	
		Texaco Fuel Station	HazMat	
		Water Tank (Flats)	Water Facility	
		Lake City Water Tank (Round Top)		
High: 2 CF	Unincorporated	CDOT Road Shop	Miscellaneous/Other	
		OHV Pilot Program Route Startpoint		
GRAND TOTAL = 22 CF				

Source: San Luis Valley GIS/GPS Authority, Hinsdale County, CWPP, HIFLD, Wood Plc analysis

Wood timber bridges, in addition, are particularly vulnerable to fires. GIS analysis shows 0 wood timber bridges in the county, out of the 19 bridges present in Hinsdale County (all of which are made of concrete material).

Economy

Tourism and ranching are important components of Hinsdale County's economy. Wildland fires can have a direct impact on agricultural lands and the County's scenery, adversely affecting the ability of the County's residents to earn a living from these industries. Hinsdale County's scenic beauty is a main draw for tourism, so the County could suffer economic losses from tourists not coming to the area due to wildfires. Fire suppression may also require increased cost to local and state government for water acquisition and delivery, especially during periods of drought when water resources are scarce.



Historic, Cultural, and Natural Resources

The entire downtown Lake City Historic District could be vulnerable to wildfires and wind-driven firebrands. In addition there are historic mines and ghost towns throughout the county that could be vulnerable to wildfires.

Next to people and property, natural resources impacts from wildfires could be severe and widespread. Wildfires are a common and naturally occurring phenomenon in forested areas and can benefit forest health in many respects. But the trend for hotter, more widespread and destructive fires can make it more difficult for the environment to recover, and lead to increased flood hazards. This can severely impact water quality and watershed health for years after the fire.

Future Development

Additional growth and development in areas of fire risk will continue to increase the exposure of the planning area to damaging wildfires, though currently that development is very limited and not expected to cause significant changes in overall risk to this hazard. Typically, the growth and development in the WUI in the County is associated with second homes.

Risk Summary

The overall significance of wildfire in Hinsdale County is High. These events are recurring in nature and have the potential to cause significant damage, loss of life, and disruption to critical infrastructure and affect the valued natural resources of the county.

- The county experiences relatively smaller wildfires every three or four years, with a major damaging fire every 8-10 years or longer.
- *Effects on people:* Past wildfires in the county have not resulted in fatalities; however, significant evacuation and sheltering could be required in the future if a fire was to break in a more populated area such as Lake City.
- *Effects on property:* Wildfires can destroy homes, businesses, and critical infrastructure. GIS analysis shows that 95 buildings are found in either moderate or high wildfire risk zones.
- *Effects on economy:* Wildfires impacts can include loss of property, direct agricultural sector job loss, secondary economic losses to businesses, and loss of public access to recreational and income resources such as tourism.
- *Effects on critical facilities and infrastructure:* Wildfires can disrupt access to, or even destroy critical facilities and infrastructure. Communication towers within the County are potentially vulnerable.
- *Related Hazards:* Drought, Flood, Utility Failure, Landslide and Debris Flow

Table 4-47 Wildfire Risk Summary in Hinsdale County

Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Hinsdale County	Extensive	Highly Likely	Catastrophic	High
Lake City	Extensive	Likely	Catastrophic	High

4.3.10 Imminent Threat/Terrorism

Hazard/Problem Definition

Imminent threat includes the potential for violent attacks, including but not limited to domestic and international terrorism. The Federal Bureau of Investigation (FBI) defines terrorism as “the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.” The threat of terrorism, both international and domestic, is ever present and an attack is likely to occur when least expected. Terrorism is a worldwide threat that must be addressed through security and awareness.

Multiple international and domestic terrorist groups are known to have links to Colorado. Eco-terrorism is of specific concern in rural Colorado. Eco-terrorism is a form of domestic terrorism that the FBI defines as “the use or threatened use of violence of a criminal nature against innocent victims or property by an environmentally-oriented, subnational group for environmental-political reasons, or aimed at an audience beyond the target, often of a symbolic nature.” According to the Southern Poverty Law Center (SPLC), extremists within the environmental and animal rights movements have committed thousands of violent criminal acts in past decades, including arsons, fire bombings, assaults, and attacks on animal-based businesses and laboratories. One notable example was the 1998 arson incident in Vail, Colorado by the Earth Liberation Front that caused \$12 million in property damage. Since 1996, these groups have committed more than 600 criminal acts, causing more than \$43 million in damage nationwide.

The SPLC also tracks 18 hate groups with a presence in Colorado as of 2018, including white nationalist and neo-Nazi organizations. While not all of these groups have a history of violence, many of them frequently use violent rhetoric and embrace individuals with a history of violence. None of the groups tracked by SPLC are headquartered in Hinsdale County, but several are listed as having members statewide.

The most commonly used weapon by terrorists are explosive devices, due to their easy accessibility and high destructive capacity. Explosive device attacks are the most prevalent in United States history, making up more than half of all U.S. terrorist attacks. A terrorist attack using chemical, biological, radiological, or nuclear weapons is also possible, and could have devastating consequences. Agro-terrorism is another term sometimes used for attempts to intentionally contaminate, ruin, or otherwise make agricultural products unfit or dangerous for consumption or further use.

Another type of imminent threat event is an active shooter incident, sometimes called a mass shooting. The U.S. Department of Homeland Security (DHS) defines an active shooter as “an individual engaged in attempting to kill people in a confined space or populated area. Active shooters typically use firearms and have no pattern to their selection of victims.” This category includes recent tragic incidents at schools, places of worship, and workplaces. The motivations for committing such acts range from retribution for a perceived injustice to promoting a specific social or political goal. Typically, active shooters are not interested in taking hostages or attaining material gain, and frequently aren’t even interested in their own survival.

Cyber attacks and cyberterrorism are addressed in the Utility Failure section.

Imminent threats to public safety are a growing concern worldwide that must be addressed through security and awareness. Needs associated with imminent threats include training and equipping of local emergency response personnel in cooperation with state and federal agencies.

Location

Terrorist acts are most often perpetrated against either critical infrastructure, against mass gatherings of people, or sometimes against symbolic or historical targets.

Active shooter incidents can potentially happen at any mass gathering, to include workplaces, schools, places of worship, or concerts and special events. A 2014 FBI study of 160 active shooter incidents between 2000 and 2013 found that 45.6% of the incidents took place in a commercial environment, followed by 24.3% in an educational location, with the remaining 30.1% divided between outdoors, military and other government properties, residential properties, houses of worship, and health care facilities.

Extent (Magnitude/Severity)

It is impossible to accurately predict or define what the magnitude and severity of a potential terrorist attack in Hinsdale County might be. An explosive attack could range from a small letter bomb with the potential to kill or injure 1-2 people, to delivery truck bombs such as the one used in the bombing of the Murrah Federal Building in Oklahoma City. While the number of terrorist attacks on U.S. soil has largely declined, the number of deaths and injuries per incident has increased.

Active shooters have similarly demonstrated the capability to kill or injure large numbers of people. The 160 incidents studied in the 2014 FBI report resulted in 1,043 casualties (486 killed and 557 wounded excluding the shooters), an average of 6.5 casualties per incident. The psychological impact of these types of incidents is often even worse than the direct impacts.

Previous Occurrences

The Global Terrorism Database records that despite public perception the number of terrorist attacks on US soil has decreased in recent decades, from an average of 147.5 incidents per year in the 1970s, to 46 per year in the 1980s and 1990s, to an average of 21.2 per year in the 2000s. However, an increase in attacks in 2016 and 2017 brought that average back up to 32.9 per year for 2011 through 2017 (the most recent year which the Global Terrorism Database has analyzed). This total only includes “traditional” terrorist attacks directed at achieving a political, economic, religious, or social goal, and thus does not include most active shooter incidents.

While Lake City and Hinsdale County lack the usual attributes of a high value target for terrorists such as a high-density population or critical infrastructure for large populations, its isolation and lack of population could make it desirable for developing or transporting weapons of mass destruction. In 1998 the FBI disbanded a militia group staging at 30 Mile Campground. A cache of weapons and a travel trailer were confiscated. In 1999 ATF came to Lake City to investigate a homemade bomb found at a public restroom. In 2003 ATF confiscated a large cache of illegal firearms and explosives when arresting a local man.

There have only been two explosive attacks recorded in Colorado in the last 40 years. In 2002 anti-government extremists in Pueblo and Salida used explosives to attack both government and private property. Most recently, in 2015 there was an explosive attack in Colorado Springs, where a man placed

an explosive device at a private property. The attack was isolated and the motive for the attack is still unknown.

Although there is much uncertainty and debate around exactly what constitutes an active shooter incident, the 2014 FBI study reported that 160 such incidents took place between 2000 and 2013. The frequency of attacks increased sharply during the 13 years of the study, from an average of 6.4 incidents per year in the first seven years of the study to 16.4 per year in the last seven years.

Probability of Future Occurrences

While the number of terrorist attacks in the US has generally declined in recent decades, the number of active shooter incidents appears to be on the rise. The unpredictable nature of these incidents makes it difficult to analyze the probability of future incidents. The probability of a terrorist and/or active shooter incident somewhere in the U.S. in the next 5 years is very high; the probability of an attack in Hinsdale County is probably low but cannot be ruled out.

Climate Change Considerations

There are no known climate change impacts relevant to this hazard.

Vulnerability

Potential losses from terrorism include human deaths and injuries, damage to property, infrastructure, critical facilities, crops, and animals. The degree of impact would be directly related to the type of incident and the target. Potential losses could include cost of repair or replacement of damaged facilities, lost economic opportunities for businesses, loss of human life, injuries to persons, loss of food supplies, disruption of the food supply chain, and immediate damage to the surrounding environment. Secondary effects of infrastructure failure could include public safety hazards, spread of disease, increased morbidity and mortality among the local and distant populations, public panic and long-lasting damage to the environment.

Terrorism events are rare occurrences and specific amounts of estimated losses for previous occurrences are not available due to the complexity and multiple variables associated with these types of hazards. In some instances, information about these events is secure and unavailable to the public in order to maintain national security and prevent future attacks.

General Property

Explosive attacks in particular can damage buildings and structures at or near the point of attack. While active shooter incidents rarely cause major property damage directly, indirect effects can be significant, such as the loss of critical facilities for days or weeks due to crime scene concerns.

People

With the exception of ecoterrorists, who have mostly focused on causing property damage, most terrorists and active shooters primarily target people. Individuals may be injured or killed by attacks. Furthermore, the county's low population means that even a small incident can have a proportionally high impact. Psychological effects of the incident, on not only victims and responders but also the general public, may last for years.

Critical Facilities and Infrastructure

Critical infrastructure is a popular target for terrorist groups, particularly attacks involving explosives. Depending on the type and severity of the attack, restoring function could take days or weeks. Impact could be critical depending on the function and importance of the asset.

Economy

Terrorist attacks can have significant economic impacts, mainly as a result of decreased travel and tourism following an attack. Terrorist attacks could also deter businesses from relocating to impacted areas, although there is not significant research to support this conclusion.

Historic, Cultural, and Natural Resources

The County's abundant natural and historic resources can also be damaged, particularly from attacks involving explosives or arson. National Forests are particularly vulnerable to arson.

Future Development

The link between increased development and imminent threat attacks is uncertain at best. A larger population could potentially make public events in the County more attractive targets for these types of attacks.

Risk Summary

- While the number of terrorist attacks on U.S. soil has been declining since the 1970s, active shooter incidents have risen in recent years.
- *Effects on people:* The primary aim of most terrorists and active shooters is to injure and kill as many people as possible.
- *Effects on property:* Terrorist attacks can cause significant property damage.
- *Effects on economy:* May result in decreased tourism or generally depress local economies.
- *Effects on critical facilities and infrastructure:* Critical facilities are often targets for terrorist attacks, particularly those involving explosives or arson.
- *Related Hazards:* Hazardous Materials, Utility Failure.

Table 4-48 Imminent Threat/Terrorism Risk Summary

Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Hinsdale County	Limited	Unlikely	Moderate	Low
Lake City	Limited	Possible	Moderate	Low

4.3.11 Hazardous Materials Incidents

Hazard/Problem Definition

Generally, a hazardous material is a substance or combination of substances which, because of quantity, concentration, or physical, chemical, or infectious characteristics, may either cause or significantly contribute to, an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness. Hazardous materials may also pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Hazardous material incidents can occur while a hazardous substance is stored at a fixed facility, or while the substance is being transported along a road corridor or railroad line or via an enclosed pipeline or other linear infrastructure.

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

Hazardous materials can be divided into the following classes:

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

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

Location

Hazmat incidents can occur at fixed facilities or during transportation. As shown below in Figure 4-47, of the handful of hazardous materials incident the county has experienced, the majority have taken place in or near Lake City.

Fixed Facilities

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

information about chemicals stored or used at the facility. The EPA also requires facilities containing certain extremely hazardous substances to generate Risk Management Plans (RMPs) and resubmit these plans every five years.

The Hinsdale County Office of Emergency Management administers the Emergency Planning and Community Right-to-Know program for the planning area. According to the Right To Know Network, as of April 2019 there are no RMP facilities located in Hinsdale County. According to the Hinsdale County LEPC, there are no Tier II facilities in the County. Similarly, CDPHE does not list any permitted hazardous waste facilities in the county. The HMPC listed the AmeriGas propane facility as being a possible concern, along with the Century Link building due to battery storage.

Two 10,000 gallon above ground propane storage facilities are located next to the County Shop on the north end of Lake City. Smaller propane tanks both above and below ground are located at virtually all residences and businesses in town. Underground fuel storage tanks are located at the State and County Shops as well as at three service stations.

Oil and gas wells can also be the sites of hazardous materials releases. However, there are no oil & gas wells located within Hinsdale County.

There are several brownfields projects resulting from mining including Ute Ulay, Gladiator Mine, Golden Fleece and Golconda. The HMPC discussed the need for a study to determine if avalanches could disturb mine tailings piles; the Colorado Department of Public Health and Environment and Colorado Division of Reclamation, Mining and Safety were noted as possible partners.

Transportation

In transit, hazardous materials generally follow major transportation routes, including road, rail and pipelines, creating a risk area immediately adjacent to these routes. There are no designated hazardous materials routes or radioactive materials routes passing through Hinsdale County. However, hazardous materials are still shipped into and out of the County for local use, and fuel truck transportation poses opportunities for spills. There are no railroads in the County, thus no potential for a rail incident.

Hazardous materials releases can also result from natural disasters, such as floods or earthquakes that may cause containment systems to fail or affect transportation infrastructure. In summary, hazardous material incidents have the potential to occur in business and industrial areas (where fixed facilities are located) and along transportation corridors. Often these facilities are concentrated in the planning area due to their manufacturing operations. Hazardous material incidents can also occur in agricultural areas; these types of facilities typically use pesticides, fertilizers, and other agricultural chemicals that are harmful to people and the environment. For example, agricultural pesticides and fertilizers are often transported daily around the planning area. Illegal drug operations and dumping sites have also been known to pose a hazardous materials threat.

Pipelines ruptures can result in major spills or even explosions. However, the National Pipeline Mapping System (NPMS) and other GIS sources do not show any major pipelines crossing the planning area.

Extent (Magnitude/Severity)

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

- Fatalities
- Injury
- Evacuations
- Property damage
- Animal fatalities (livestock, fish & wildlife)
- Air pollution
- Surface or ground water pollution/contamination
- Interruption of commerce and transportation

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

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

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

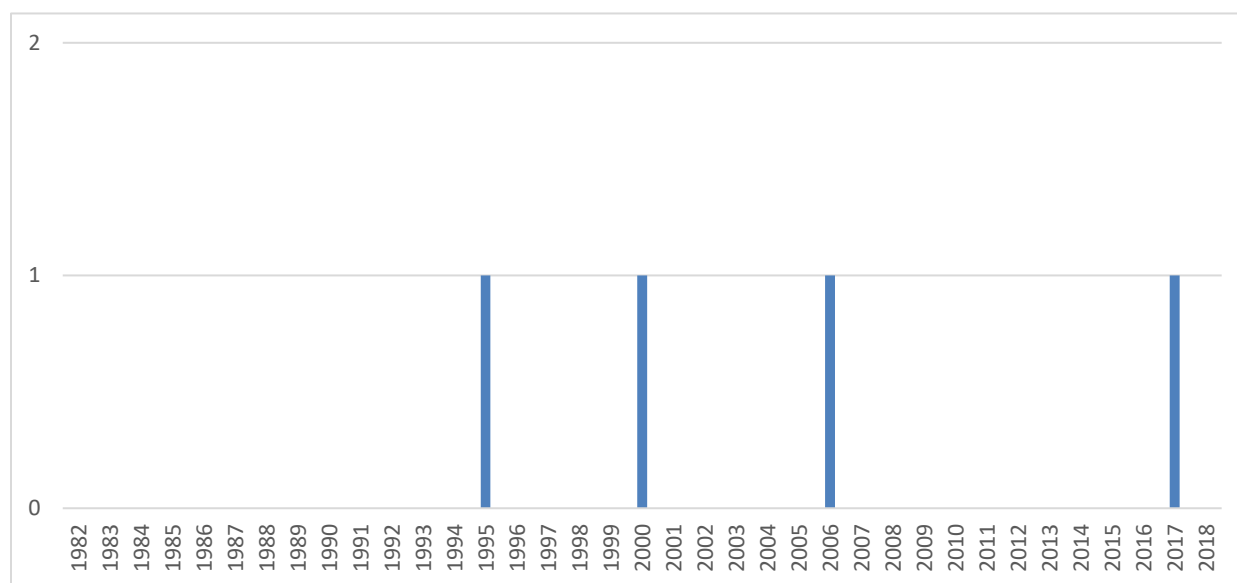
As noted above, Hinsdale County does not contain any facilities that store and use significant quantities of hazardous materials, nor are major quantities of hazardous materials transported through the county. This limits the severity of hazardous incidents the county is likely to experience. However, there are cleanup and disposal costs even for small incidents. In a larger scale incident, cleanup can be extensive and protracted. There can be deaths or injuries requiring doctor's visits and hospitalization, disabling chronic injuries, soil and water contamination can occur, necessitating costly remediation. Evacuations can disrupt home and business activities. Large-scale incidents can easily reach \$1 million or more in direct damages, with clean-ups that can last for years.

Previous Occurrences

As mentioned above, the Right to Know Network (www.rtk.net) tracks hazardous materials incidents and spills. From 1982 through 2018, rtk.net lists only four hazardous materials incidents in the county, as shown below in Figure 4-47 and Table 4-49. There were no reported injuries, fatalities, damage, or evacuations pertaining to any of these four incidents. Note that while half the incidents were listed as "Fixed," those spills took place on or near roads rather than at chemical storage facilities.



Figure 4-47 Hazardous Materials Incidents in Hinsdale County, 1982-2018



Source: www.rtk.net

Table 4-49 Hazardous Materials Incidents in Hinsdale County, 1982-2018

Date	Type	Location	Material	Responsible Party	Injuries/Deaths	Damage
11/10/1995	Transport	Lake City	Gasoline, unknown quantity	Private Enterprise	0/0	0
8/14/2000	Fixed (Dumping)	Creede	Creosote, 20 gallons	Unknown	0/0	0
4/11/2006	Transport	Lake City	Hydraulic Oil, 1 gallon	Private Enterprise	0/0	0
7/25/2017	Fixed (Roadside)	Lake City	Magnesium chloride, unknown quantity	State Government	0/0	0

Source: www.rtk.net

This list in no way captures all hazardous material spills within the county, only those that were significant enough to be reported to the NRC.

Propane leaks at the fixed facility have necessitated Fire and EMS response at least twice since 1999. In one instance a vapor cloud accumulated in the low area around the tank, spreading to a residence 200 feet away and building to a depth of 4 feet.

It is difficult to draw strong conclusions from such a small number of hazardous materials incidents. However, the data shows that the number of significant hazardous materials incidents in the county is low and does not appear to be increasing.

Probability of Future Occurrences

As discussed above, the county experiences a hazardous materials incident every 5-10 years, and has yet to experience an incident resulting in reported fatalities, injuries, evacuations, or damage. Thus, the county

is likely to experience further hazardous materials incidents in the future. While the historical record indicates that damaging, injury-causing spills are unlikely, the potential cannot be ruled out.

Climate Change Considerations

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

Vulnerability

General Property

The impact of a fixed hazardous facility, such as a chemical processing facility is typically localized to the property where the incident occurs. The impact of a small spill (i.e. liquid spill) may also be limited to the extent of the spill and remediated if needed. While cleanup costs from major spills can be significant, they do not typically cause significant long-term impacts to property.

People

Hazardous materials incidents can cause injuries, hospitalizations, and even fatalities to people nearby. People living near hazardous facilities and along transportation routes may be at a higher risk of exposure, particularly those living or working downstream and downwind from such facilities. For example, a toxic spill or a release of an airborne chemical near a populated area can lead to significant evacuations and have a high potential for loss of life.

In addition to the immediate health impacts of releases, a handful of studies have found long term health impacts such as increased incidence of certain cancers and birth defects among people living near certain chemical facilities. However, there has not been sufficient research done on the subject to allow detailed analysis.

Critical Facilities and Infrastructure

Impacts of hazardous material incidents on critical facilities are most often limited to the area or facility where they occurred, such as at a transit station, airport, fire station, hospital, or railroad. However, they can cause long-term traffic delays and road closures resulting in major delays in the movement of goods and services. These impacts can spread beyond the planning area to affect neighboring counties, or vice-versa. While cleanup costs from major spills can be significant, they do not typically cause significant long-term impacts to critical facilities.

Economy

The primary economic impact of hazardous material incidents results from lost business, delayed deliveries, property damage, and potential contamination. Large and publicized hazardous material-related events can deter tourists and recreationists and could potentially discourage residents and businesses. Economic effects from major transportation corridor closures can be significant.

Historic, Cultural, and Natural Resources

Hazardous material incidents may affect a small area at a regulated facility or cover a large area outside such a facility. Widespread effects occur when hazards contaminate the groundwater and eventually the municipal water supply, or they migrate to a major waterway or aquifer. Impacts on wildlife and natural resources can also be significant.

Future Development

The amount of hazardous materials that are stored, used, and transported across the county are not anticipated to increase over the next five years based on regional growth trends.

Risk Summary

The overall significance of hazardous materials incidents in Hinsdale County is Low. Significant incidents have occurred infrequently at fixed sites and along transportation routes throughout the county. The possibility of a spill impacting populated areas or environmentally sensitive areas exists; historically the impacts of these incidents on the county as a whole have been fairly limited.

- The county experiences a notable hazardous materials incident every 5-10 years.
- Since 1982, none of these incidents have resulted in injuries, fatalities, damages, or required evacuations.
- Hazardous materials releases can complicate response to and recovery from natural disasters such as floods, earthquakes, and severe storms.
- *Effects on people:* Hazardous Materials incidents can cause injuries and fatalities, as well as long term health problems like increased cancer risks, but is highly dependent on the location of the incident.
- *Effects on property:* Impacted properties can require cleanup, but the effects are usually localized to the site of the release.
- *Effects on economy:* Extended road closures can result in economic losses and impact tourism.
- *Effects on critical facilities and infrastructure:* Impacted facilities and infrastructure can require cleanup, but the effects are usually localized to the site of the release.
- *Related Hazards:* Earthquake, Flood, Severe Thunderstorm, Severe Winter Storm, Terrorism.

Table 4-50 Hazardous Materials Risk Summary

Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Hinsdale County	Limited	Likely	Negligible	Low
Lake City	Limited	Likely	Negligible	Low

4.3.12 Pandemic Influenza

Hazard/Problem Definition

A pandemic is a global disease outbreak. An influenza pandemic is a virulent human flu that causes a global outbreak of serious illness. A flu pandemic occurs when a new influenza virus emerges for which people have little or no immunity, and for which there is not an effective vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in very brief time. The U.S. Centers for Disease Control and Prevention has been working closely with other countries and the World Health Organization to strengthen systems to detect outbreaks of influenza that might cause a pandemic and to assist with pandemic planning and preparation.

There are three conditions that must be met before a pandemic influenza begins:

1. A new virus subtype must emerge that has not previously circulated in humans (and therefore there is no pre-existing immunity),



2. This new subtype must be able to cause disease in humans, and
3. The virus must be easily transmissible from human to human.

Most recently, health professionals are concerned by the possibility of an avian (or bird) flu pandemic associated with a highly pathogenic avian H5N1 virus. Since 2003, avian influenza has been spreading through Asia. A growing number of human H5N1 cases contracted directly from handling infected poultry have been reported in Asia, Europe, and Africa, and more than half the infected people have died. There has been no sustained human-to-human transmission of the disease, but the concern is that H5N1 will evolve into a virus capable of human-to-human transmission.

An especially severe influenza pandemic could lead to elevated levels of illness, death, social disruption, and economic loss. Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines.

Location

The entire County and population could potentially be affected by a pandemic flu outbreak.

Extent (Magnitude/Severity)

Overall, the impacts from a pandemic flu outbreak in Hinsdale County could be critical, with 25-50% of the planning area's population affected. The elderly and infants would likely be impacted the most. Local medical facilities could be rapidly overwhelmed. The medical facilities of neighboring jurisdictions would most likely be overwhelmed as well and unable to provide assistance to Hinsdale County.

The magnitude of a health-related emergency will range significantly depending on the aggressiveness of the virus in question and the ease of transmission. Pandemic influenza is easily transmitted from person-to-person but advances in medical technologies have greatly reduced the number of deaths caused by influenza over time. In terms of lives lost, the impact various pandemic influenza outbreaks have had globally over the last century has declined.

A recent trend in parents not vaccinating their children could increase the likelihood and severity of an outbreak. Some estimates put the number of unvaccinated children in Hinsdale County as high as 33%.

The tourism based economy and high percentage of second-home ownership in Summit County could mean elevated risk due to increased seasonal travel.

Previous Occurrences

There have been four acknowledged pandemics in the last 100 years:

- 1918-19 Spanish flu (H1N1)—This flu is estimated to have sickened 20-40% of the world's population. Over 20 million people lost their lives. Between September 1918 and April 1919, 500,000 Americans died. The flu spread rapidly; many died within a few days of infection, others from secondary complications. The attack rate and mortality were highest among adults 20-50 years old; the reasons for this are uncertain. It is likely that the Spanish flu impacted Hinsdale County given the nature of that particular strain, but exact impacts are unknown.
- 1957-58 Asian flu (H2N2)—This virus was quickly identified due to advances in technology, and a vaccine was produced. Infection rates were highest among school children, young adults, and pregnant women. The elderly had the highest rates of death. A second wave developed in 1958. In

total, there were about 70,000 deaths in the United States. Worldwide deaths were estimated between 1 and 2 million.

- 1968-69 Hong Kong flu (H3N2)—This strain caused approximately 34,000 deaths in the United States and more than 700,000 deaths worldwide. It was first detected in Hong Kong in early 1968 and spread to the United States later that year. Those over age 65 were most likely to die. This virus returned in 1970 and 1972 and still circulates today.
- 2009 H1N1 flu—The 2009 H1N1 virus was first detected in the US in April 2009. It is now believed that the outbreak began in either Mexico or somewhere in Asia. The World Health Organization officially declared a pandemic on June 11, 2009. Testing of the strain indicated that it did not contain markers associated with high deaths rates or increased risk of severe disease. About 70% of people who were hospitalized with this 2009 H1N1 virus have had one or more medical conditions previously recognized as placing people at “high risk” of serious seasonal flu-related complications. This included pregnancy, diabetes, heart disease, asthma, and kidney disease. Young children were also at high risk of serious complications from 2009 H1N1, just as they are from seasonal flu. The elderly were not disproportionately affected by this strain, which is rare for most flu viruses. And while people 65 and older were the least likely to be infected with 2009 H1N1 flu, if they got sick, they were also at “high risk” of developing serious complications from their illness. The World Health Organization (WHO) declared the pandemic to be officially over in June 2010. The WHO estimated that over 18,000 people died of the H1N1 strain world-wide. This number could potentially be much higher. Deaths related to this particular strain of the virus could have gone unconfirmed or unreported. Nevertheless, this number is lower than the 250,000 to 500,000 people around the world who die of seasonal flu strains each year. In Colorado, by May of 2010 there had been 2,041 hospitalizations across 54 counties; a total of 69 Coloradans died.

Probability of Future Occurrences

The Colorado Department of Public Health and Environment (CDPHE) considers another pandemic to be inevitable. However, there is no reliable way to predict when the next pandemic might happen. Some indicators will be present, but not every new virus turns into a pandemic.

Based on four worldwide outbreaks that affected the United States in the last 100 years, a pandemic outbreak occurs on average roughly every 25 years.

Climate Change Considerations

According to the best data available at the time of this plan update, the future impacts of climate change are expected to exacerbate future pandemics. Climate change will influence vector-borne disease prevalence, although the direction of the effects (increased or decreased incidence) will be location- and disease specific. The intensity and extent of certain diseases is projected to increase. Disadvantaged populations are expected to bear a greater burden as a result of their current reduced access to medical care and limited resources for adaptation strategies.

Additional research is needed to determine the effects of climate change on the frequency and duration of epidemics and pandemics. Ongoing efforts to reduce Colorado’s greenhouse gas emissions and adapt to a changing climate, such as the Colorado Climate Plan, may help to reduce the impacts of climate change on pandemics.



Vulnerability

In the event of a pandemic, medical personnel would be incredibly overtaxed. Help from the federal government and from other states would likely be limited, as all personnel would be deployed throughout the country already. While the federal government would do what they can, communities would have to rely on their own resources for a much longer period of time as compared to other disasters.

Medications may be limited to help prevent or treat the disease. It takes five to six months to manufacture a vaccine, but it would likely become available in small quantities at first. It may become necessary to ration limited amounts of medications, vaccinations, and other health care supplies.

Social and economic disruptions could be temporary but may be amplified in today's closely interrelated and interdependent systems of trade and commerce. Social disruption may be greatest when rates of absenteeism impair essential services, such as power, transportation, and communications.

The 2018 Colorado State Hazard Mitigation Plan lists the assumptions and guidelines for pandemic influenza planning:

- A. Susceptibility to the virus will be universal.
- B. The clinical disease attack rate will be about 30% of the overall population. The highest rates will be among school-aged children, at around 40%. About 20% of working adults will become ill.
- C. Of those who become ill with the new strain, 50% will seek outpatient medical care.
- D. In an infected community, a pandemic outbreak will last about six to eight weeks, with at least two waves likely. The seasonality cannot be predicted with certainty.
- E. The number of hospitalizations and death will depend on the virulence of the virus.
- F. Based on an extrapolation for a severe pandemic, Colorado deaths are estimated to exceed 30,000. It is assumed that the pandemic will occur in two waves, lasting six to eight weeks each. Colorado can expect to see approximately 350 deaths per day. This factors in the 80 deaths per day that Colorado typically has per day.
- G. Risk groups for severe and fatal infections cannot be predicted with certainty. During annual fall and winter influenza season, infants and the elderly, persons with chronic illnesses, and pregnant women are usually at higher risk of complications from influenza infections.
- H. In a severe pandemic, it is expected that absenteeism may reach 40% due to illness, the need to care for ill family members, and fear of infection during the peak weeks of a community outbreak. Certain public health measures (closing schools, quarantining household contacts of infected individuals, "snow days") are likely to increase rate of absenteeism.
- I. The typical incubation period is two days. It is assumed this would be the same for a novel strain that is transmitted between people by respiratory secretions.
- J. Persons who become ill may shed the virus, and can transmit infection for up to one day before the onset of symptoms. Viral shedding and the risk of transmission will be greatest during the first two days of illness. Children shed the greatest amount of virus and are therefore the most likely to pose a risk for transmission.
- K. On average, infected persons will transmit the infection to approximately two other people. Some estimates from past pandemics have been higher.



- L. Outbreaks can be expected to occur simultaneously throughout much of the United States, preventing shifts in human and material resources that usually occur in response to other disasters.
- M. Localities must be prepared to rely on their own resources to respond. The effect of influenza on individual communities will be relatively prolonged (weeks to months) in comparison to other types of disasters.
- N. Healthcare workers, public health workers, and other responders (i.e., law enforcement and firefighters) may be at higher risk of exposure and illness than the general population, further straining the pandemic response.
- O. Effective prevention and therapeutic measures, including vaccine and antiviral agents, may be delayed and, initially, in short supply or not available.
- P. Substantial public education regarding the need to target priority groups for vaccination and possibly for antiviral medication, and rationing of limited supplies, is paramount to controlling public panic.
- Q. Adequate security measures must be in place while distributing limited supplies of vaccine or antiviral medication.
- R. All plans must account for the uncertainty of the situation.

General Property

Property would not be directly affected by a pandemic.

People

Pandemics have the ability to shut down large segments of the population for long periods of time. The total County population of 794 could potentially be exposed to a pandemic flu outbreak. According to the CDPHE, the disease could affect approximately 30% of the state's overall population and 10% may need to be hospitalized. Illness rates will be highest among school-age children (about 40%) and decline with age. The HMPC noted that a trend in parents not vaccinating children could make them more vulnerable. A statistic of 33% of the kids not having vaccinations was noted by the HMPC. Among working adults, an average of 20% will become ill during a community outbreak. In a severe pandemic, it is expected that absenteeism may reach 40% due to illness, the need to care for ill family members, and fear of infection.

The number of hospitalizations and deaths will depend on the virulence of the virus. Risk groups cannot be predicted with certainty. During the annual influenza season, infants, the elderly, the chronically ill, and pregnant women are usually at higher risk; however as discussed above this is not always true for all influenza strains.

Critical Facilities and Infrastructure

Facilities and infrastructure would not be directly affected by a pandemic but would be indirectly affected by the population impacts. Schools and hospitals will take the brunt of a pandemic. Nearly 40% of children may contract a pandemic flu, which can result in Lake City Community School needing to close to halt the spread of the disease. Lake City Area Medical Center will be greatly overburdened during this period because of the influx of new patients. It is possible that infrastructure may not be able to be maintained as necessary during a pandemic because of a significantly decreased workforce.



Economy

In the event of a pandemic, 30-50% of the working population may be out sick. Unscheduled sick leave from a large portion of the workforce could result in considerable lost productivity. Fear of public gatherings could eliminate most in-person commerce.

Historic, Cultural, and Natural Resources

There are not likely to be any environmental effects from a pandemic.

Future Development

Population growth and development contribute to pandemic exposure.

Risk Summary

- Pandemics affecting the U.S. occur roughly once every 25 years but cannot be reliably predicted.
- *Effects on people:* 30% of the population could become ill, and 10% may need to be hospitalized
- *Effects on property:* Minimal
- *Effects on economy:* Unscheduled sick leave could result in in lost productivity. Fear of public gatherings could eliminate most in-person commerce.
- *Effects on critical facilities and infrastructure:* Indirect impacts from absenteeism.
- *Related Hazards:* None

Table 4-51 Pandemic Risk Summary

Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Hinsdale County	Extensive	Occasional	Critical	Medium
Lake City	Extensive	Occasional	Critical	Medium

4.3.13 Utility Failure

Hazard/Problem Definition

Utility failure refers to any significant disruption to power, water/wastewater, telecommunications, and/or information technology services. Short term, localized service interruptions are common and generally have minimal impact. However, widespread and long-lasting service disruptions can have cascading effects that negatively impact the security, public health and safety, and economic vitality of the county and region. While utility failure is most often thought of as the consequence of another hazard or disaster, this section examines utility failure as its own hazard with its own set of consequences.

Power Outage

A power outage is a loss of electricity or gas service to residential, commercial, industrial, or public sector facilities. Power failure can be a stand-alone hazard, or a cascading hazard resulting from another event, such as a winter storm or flood. Some outages can occur with little-to-no advance warning, such as with an equipment failure or an avalanche. In other cases, advance indications may provide some warning hours or days ahead of time, such as a prolonged heat wave or a disruption in out-of-state fuel supply.

Electricity service in Hinsdale County is provided by Gunnison County Electric Association, a non-profit member-owned cooperative. Propane service for heating is very common in the county, particularly in rural areas. There is no commercial natural gas service in Hinsdale County.

Minor electric outages affecting a small number of people for a short period of time occur regularly in Hinsdale County and throughout Colorado; typically, they are resolved by the utility without public sector assistance. Local government normally only becomes involved when an outage affects a large number of people and lasts for a prolonged period. Extended power outages can have a significant impact on the people, infrastructure, and economy. In particular, power failures that occur during periods of extreme cold are more likely to have widespread impacts on the public.

Propane service, by its nature, tends to be less vulnerable to service outages. Supply chain disruptions could potentially impact the availability and price of propane in the county, but this is not a common occurrence.

Water/Wastewater

The Town of Lake City maintains water and sanitation facilities for customers within its district, which extends beyond the limits of the Town. Maintenance and operation is overseen by the Town Public Works Director.

The more rural areas of the county generally rely on well water and septic sewer systems. As with propane service, the disconnected nature of these systems makes them less vulnerable to widespread disruptions.

Telecommunications

Traditional landline telephone service in Hinsdale County is supplied primarily through Century Link. Most major cell phone companies provide service in the county, although coverage is sparse outside of Lake City.

Information Technology

In addition to physical failures, information technology systems are vulnerable to cyber attacks, the deliberate exploitation of computer systems, technology-dependent enterprises, and networks. Malware, or malicious software, and data breaches are also significant threats. The Hinsdale County Clerk's Office was hit with a ransomware attack in July 2016, which resulted in a bitcoin payout. Another cyber incident in December 2018 changed County employee protocols related to sensitive bank information.

Digital Subscriber Line (DSL) service is available through telephone providers like CenturyLink using telephone infrastructure. DSL is available to 87.66 percent of Lake City homes. Copper DSL lines don't have as much bandwidth as fiber/cable lines, resulting in reduced download and upload speeds. This is one of the reasons average speed tests in Lake City perform under the state average, coming in with 6.11 Mbps, as opposed to the 48.88 Mbps average data rate in Colorado. Satellite Internet provides a backup choice for county residents, with coverage for practically one hundred percent of the area.

Location

Utility failures can occur in any populated area of Hinsdale County, although water and wastewater failures affecting more than a single home are uncommon in rural areas. Hazards in unpopulated parts of the county or even outside of the county can also cause utility failures in the populated areas of the county.



Extent (Magnitude/Severity)

The severity of utility outages is generally described in terms of the number of people affected, and the length of time the outage lasts. Depending upon the cause, utility outages can last a few seconds, a few hours, or in extreme cases several days. Similarly, the number of people affected varies widely based on the type and location of the problem.

Approximately 89 percent of Colorado's electricity is generated in-state, using a mix of coal, natural gas, hydroelectric, and renewable sources; this makes the state somewhat less vulnerable to out-of-state disruptions. Colorado's electrical grid also has a relatively high degree of redundancy and extra capacity, making it easier for service providers to reroute and restore power to most areas. Widespread, long-term outages are therefore uncommon, but can have major impacts when they do occur.

A natural or human-caused hazard can disable key electric and liquid fuel facilities, resulting in local, statewide, or possibly regional (e.g., western United States) blackouts and/or brownouts. A widespread electricity outage can cause shortages in generation of fuel supplies and vice versa.

Water and wastewater interruptions tend to be localized, but can occasionally have long-lasting impacts as was seen in the salmonella outbreak in Alamosa, Colorado's water system in 2008.

Short-term and localized interruptions to telephone service, like power outages, are fairly common throughout the county. Widespread, long-lasting outages are rarer but not unknown. And because many residents get internet service through their telephone lines, phone service outages also result in internet outages.

Previous Occurrences

Hinsdale County has certainly experienced utility outages in the past. However because privately-owned utilities do not generally publicize the frequency of service outages at the county level, it is difficult to gather reliable data on outages. Loss of internet service and loss of cell phone service occur frequently in the County; the HMPC cited the June 21, 2019 internet outage as a recent example.

The Privacy Rights Clearinghouse, a nonprofit organization based in San Diego, maintains a timeline of data breaches reported in the United States since 2005. Their database does not list any data breaches targeting Hinsdale County entities. Nonetheless, Hinsdale County residents have had their data stolen in data breaches targeted elsewhere.

Probability of Future Occurrences

A lack of reliable data on past outages makes it difficult to assess the probability of significant outages in the future. However, the 2019 Colorado State Hazard Mitigation Plan notes several factors such as more aging infrastructure, extreme weather, growing interdependencies, and cyber vulnerabilities, the convergence of which are expected to make utility outages more likely in the future.

Climate Change Considerations

Climate change projections show an increase in the frequency and severity of many of the hazards that impact the energy sector, thus potentially leading to an increase in the frequency of power failures. Higher average temperatures can be expected to put increased demand on the energy sector during summer months, while colder-than-normal temperatures can increase load during winter months. Similarly, increased heat could lead to increased demand for water, placing more stress on water delivery

infrastructure; though the higher elevation location of Hinsdale County makes it less susceptible to extreme or prolonged heat events.

Vulnerability

The interdependencies between different utilities means that a failure in one sector can cause outages or system stress in other sectors. Electricity outages in particular can cause failures in other utilities that depend on electricity to function. Much of our modern way of life is built around an assumption of easily-accessible and uninterrupted power supply. Virtually every critical infrastructure sector is heavily energy-dependent, as is the general public. Similarly, the increasing reliance on information technology makes other sectors and systems vulnerable to cyber failures, whether accidental or intentional.

Maintaining commercial, government, and even basic intra-organizational disaster response capabilities during a long-term and large-scale energy disruption becomes increasingly difficult over time.

General Property

One of the planning scenarios analyzed for the 2016 Colorado Threat and Hazard Identification and Risk Assessment (THIRA) and State Preparedness Report (SPR) was a widespread power outage lasting several days resulting from a major winter storm. Some of the impacts identified for this worst-case scenario planning were:

- The outage disrupted 1300 power/energy facilities, over 700 communications facilities, more than 50 transportation systems, and over 1000 healthcare facilities.
- Loss of electrical power impacts food storage, resulting in the need for consumer protection measures as soon as possible after the event has been stabilized.
- Loss of electrical power will require reliance on battery power for radio communications, which may become depleted over time.
- Accurate damage assessments and restoration estimates may not be available for decision-makers for several days.
- For the general public, the loss of power will bring about severe isolation, despair, and uncertainty within 24 hours.

Similarly, a drinking water contamination incident or the denial of drinking water services could severely impact manufacturing facilities, food and agricultural operations, healthcare services, and the operation of government and emergency services. A major, prolonged loss of clean water could have far-reaching public health, economic, environmental, and psychological impacts. Disruption of wastewater treatment facilities or services can cause loss of life, economic impacts, and severe public health and environmental impacts. If wastewater infrastructure were to be severely damaged or destroyed, the lack of redundancy in the sector might cause a loss of service potentially affecting the habitability of homes and work spaces in all sectors.

People

Widespread utility outages could result in public alarm and anxiety depending on the timing of the event (i.e., winter/summer) and potential duration (i.e., days/weeks/months).

The residential segment constitutes 85 percent of retail electricity consumers in the United States, and the residential sector is most at-risk for disruption due to reliance on more extensive power distribution infrastructure than larger commercial and industrial end-users. The average duration of power



interruption in the United States is seven minutes, and the vast majority of interruptions are less than 24 hours in duration.

The impact of power outages are more severe during periods of extreme heat or extreme cold. Children, the elderly, and people with health problems are most at risk. Contamination of water systems can potentially have major health impacts, as was seen in the 2008 Alamosa incident.

Critical Facilities and Infrastructure

Power failures are particularly critical at sites where the environment and public safety are at risk. Many critical facilities such as hospitals, telecommunications sites, and water treatment plants typically have backup power sources such as standby generators; however, it is not uncommon to have such generators fail just when they're needed most. And some facilities such as shelter sites, and even some local Emergency Operations Centers (EOCs) may not have generators at all. Furthermore, resupplying generators with diesel fuel becomes an additional logistical issue.

Critical facilities that do have backup power include County Sheriff's Office (partial), the Medical Center and EMS station.

Critical facilities that do not have backup power include the Lake City Town Hall and Armory. The School District may need one as the school functions as an emergency shelter.

The Gunnison/Hinsdale Combined Emergency Telephone Service Authority has backup power to remain operational during a power outage. However, loss of electrical or telephone service can make it more difficult for people to call for assistance.

An emergency or disaster, either natural or human-caused, may disable key electric and liquid fuels generation/production, distribution, and delivery facilities resulting in local, statewide, and possibly regional (e.g., western United States) blackouts and/or brownouts. Additionally, the fuel supply system used for generation may be interrupted.

Of particular concern is the vulnerability of critical infrastructure to cyberattacks. Worst-case scenarios involving hackers remotely gaining control of utilities or infrastructure have not occurred yet, but such an event would have wide-ranging impacts.

Economy

The costs associated with energy-sector disruptions are known to be significant. According to a 2005 study, losses due to power interruption across all business sectors are estimated at between \$104-164 billion annually, and costs associated with power quality problems are estimated at \$15-24 billion annually. Industrial, tech, and digital business firms lose an estimated \$5.7 billion annually due to power interruption, and among high-tech business firms, the costs of downtime due to power interruption can exceed \$1 million per minute. In 2009, the US Department of Energy estimated that power outages cost an average of \$150 billion annually, or about \$500 for every US citizen per year. Based on an interim Department of Energy report on the 2003 Northeast Blackout, a statewide power disruption in Colorado could cost between \$18-49 million per hour. Interruption of credit card services can cause significant disruptions to commerce.

Though residential consumers are primarily impacted by an electric energy disruption, it is the commercial and industrial sectors that account for the vast majority of financial losses. Even short-term interruptions

can incur significant costs, due to the nature of industrial and information technology processes: a momentary interruption or transient fault may produce substantial waste of industrial resources and business time, as production lines must be halted and restarted. Likewise, in the information technology and financial sectors, the costs of data loss and operational downtime can be substantial. For vulnerable public agencies and private-sector businesses, the costs of data loss may remain constant regardless of total downtime. Similarly, even short outages can have a great effect on refineries, as evidenced by an outage at Suncor's Commerce City refinery in 2007. The power disruption was brief, but it caused the refinery to take much of its machinery offline to perform damage check before restarting. This shutdown ultimately resulted in a production loss of 50,000 barrels of gasoline and 30,000 barrels of diesel and jet fuel.

Historic, Cultural, and Natural Resources

Utility outages generally have minimal impact on historic, cultural, and natural resources.

Future Development

Future developments will continue to be vulnerable to power failures. This vulnerability may be mitigated somewhat by the introduction of new technologies such as smart grid technologies, distributed generation, and micro-grids.

Risk Summary

The overall significance of significant utility failure incidents in Hinsdale County is Moderate. Minor, localized outages will continue to occur throughout the County as well.

- Short term, localized interruptions to power, water/wastewater, telecommunications, and/or internet service are common, but generally have minimal impact. Widespread and long-lasting disruptions can have cascading effects that negatively impact security, public health and safety, and economic vitality.
- Utility outages often occur as cascading incidents resulting from other natural or human-caused hazards, such as floods, wildfires, or acts of terrorism. But they can also result from equipment failures, operator error, or other causes.
- *Effects on people:* Long-term outages can impact the health, safety, and morale of residents.
- *Effects on property:* utility outages rarely have long-lasting impacts on buildings.
- *Effects on economy:* power outages in particular can have a major economic impact, estimated at over \$100 billion annually nationwide.
- *Effects on critical facilities and infrastructure:* Many critical facilities have generators for backup power, but not all of them do.
- *Related Hazards:* All hazards profiled in this plan have the potential to cause utility outages, notably wildfire, severe thunderstorm, winter storms and avalanche

Table 4-52 Power Failure Risk Summary

Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Hinsdale County	Significant	Likely	Critical	Medium
Lake City	Significant	Likely	Critical	Medium



4.3.14 Transportation Accidents

Hazard/Problem Definition

Transportation accidents encompass any incident involving transportation that results in property damage, injuries, or loss of life. This can include traffic accidents involving automobiles, busses, and commercial trucks. The category also includes railroad accidents, although there are no rail lines in Hinsdale County. Aircraft accidents are also covered; despite not having an airport, airplane crashes in Hinsdale County are possible.

Nationally, the U.S. experiences over 6 million auto accidents a year resulting in more than 30,000 fatalities every year. The number of fatalities has declined significantly since the 1970s, when over 50,000 people died in traffic accidents each year, but remains the third leading cause of preventable deaths in the U.S.

Hinsdale County roads pass through mountainous terrain and provide many opportunities for vehicular mishaps, regardless of the season. The twists and turns, loose rocks and slides, narrow sections without guardrails, hairpin turns and steep grades, mixed traffic consisting of semi-trucks, SUVs, ATVs, trucks pulling an assortment of trailers, motorcycles, bicycles, and runners all combine to make travel throughout the county potentially hazardous. Law enforcement patrols throughout the county encourage safety on the road by enforcing speed limits, and backcountry ranger patrols assure that visitors to the area are utilizing appropriate vehicles during their outings.

Accidents involving off road vehicles are an issue in Hinsdale County; however, a lack of good data on these types of accidents makes analysis difficult. The Consumer Product Safety Commission reports that 193 people died in All Terrain Vehicle (ATV) crashes in Colorado during the period 1982 through 2013 (the last year for which data was available; this translates to roughly 6 people statewide per year. County-level statistics for off road vehicle crashes are not available; therefore, this profile focuses primarily on accidents on public roads and highways.

Accidents involving hazardous materials are included in these accident counts but are also addressed separately in the Hazardous Materials section.

Location

The majority of reported traffic accidents in the county occur on State Highway 149 or in Lake City. Blockage of State Highway 149 is of particular concern. Airplane crashes are possible anywhere within the county.

Extent (Magnitude/Severity)

Transportation accidents can range from minor "fender benders" to crashes causing significant property damage, injuries, and fatalities. The potential for bus accidents (school busses, tour busses), and logging truck incidents are also of concern. Transportation incidents can also release hazardous materials, affecting people, property and the environment; hazardous materials incidents are discussed in the hazardous materials section.

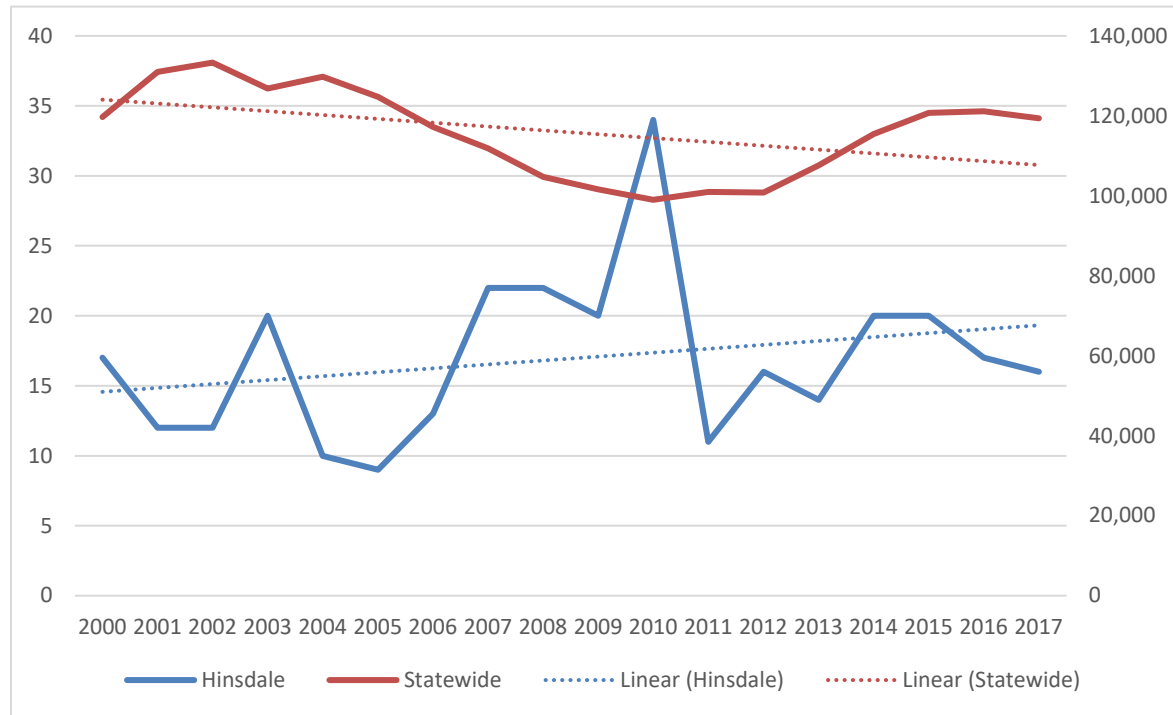
Previous Occurrences

The Colorado Department of Transportation (CDOT) has recorded 305 traffic accidents in Hinsdale County from 2000 through 2017. Overall in this 18-year period, the county averaged 17 traffic accidents per year.

This is by far the lowest number of traffic accidents of any Colorado county. The 2nd lowest, Kiowa County, averages 37 accidents per year. Since 2000, Hinsdale has had the fewest accidents of any Colorado county every year except 2010.

Between 2000 and 2018, the population of Hinsdale County increased 6.7% from 790 to 843; the number of traffic accidents increased 26% from 15 per year during the 2000s to approximately 19 per year during the 2010s. By contrast, statewide the number of traffic accidents declined 16% during that same period, as shown in Figure 4-48.

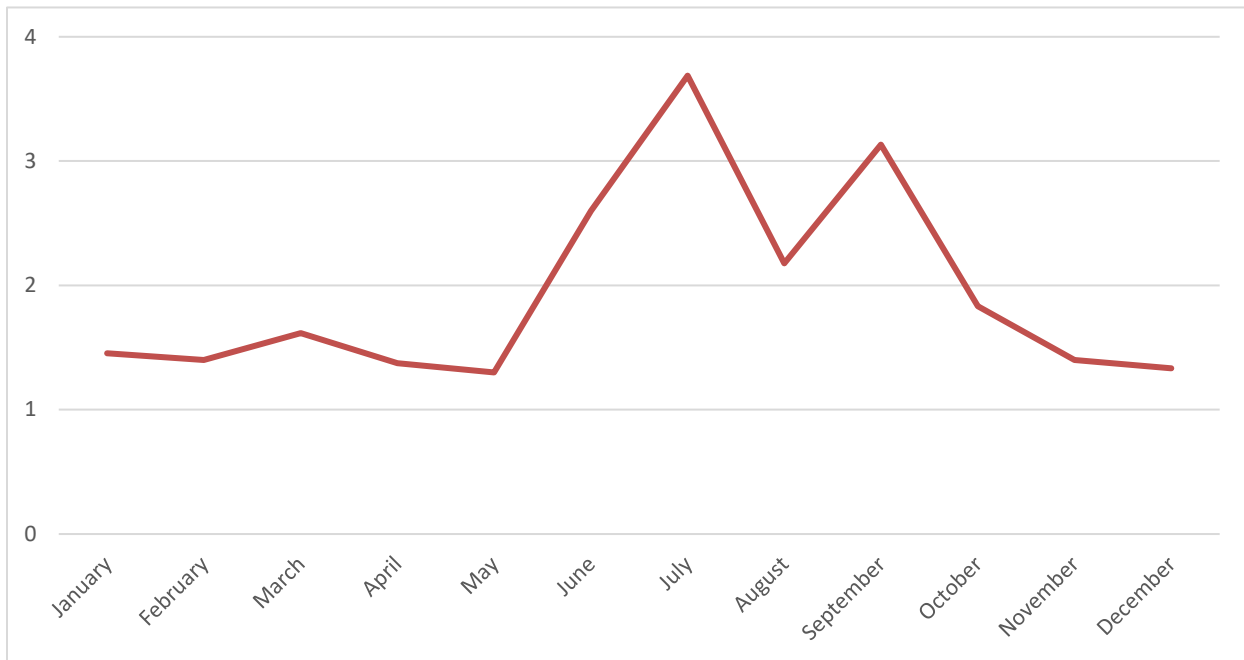
Figure 4-48 Traffic Accidents in Hinsdale County and the State of Colorado, 2000-2017



Source: Colorado Department of Transportation Crash Data; analysis by Wood.

The number of traffic accidents is significantly higher during summer months, as shown in Figure 4-49.

Figure 4-49 Average Number of Traffic Accidents in Hinsdale County by Month, 2000-2017

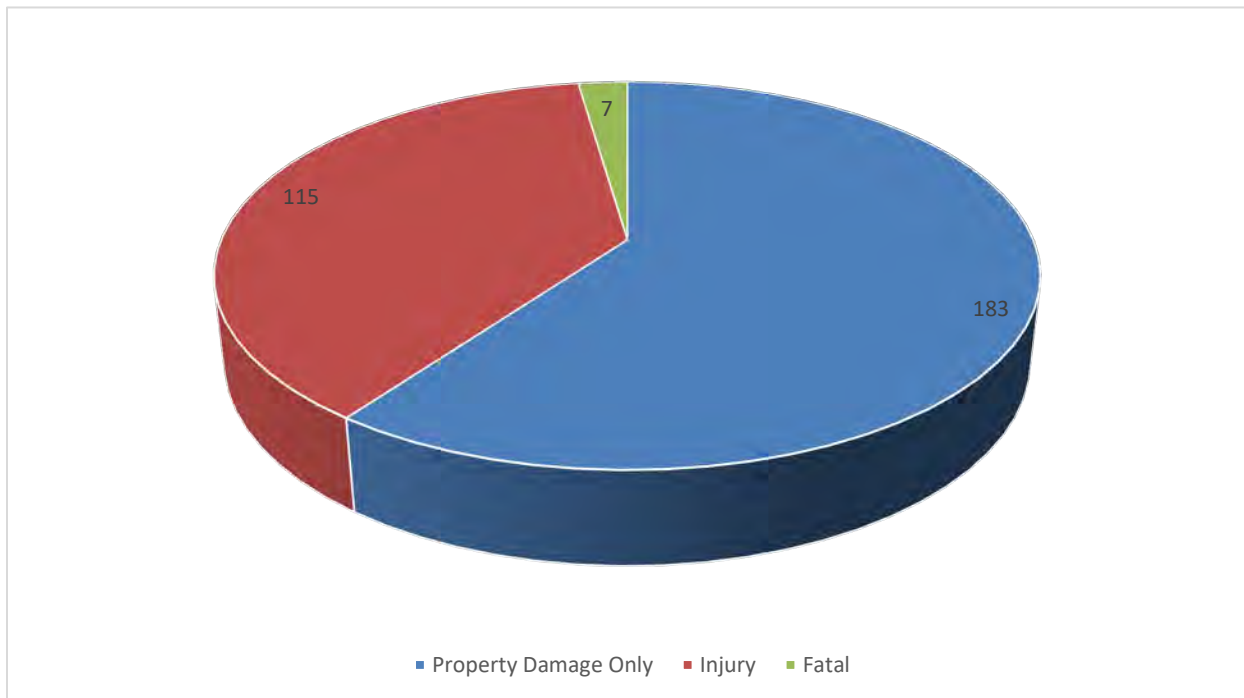


Source: Colorado Department of Transportation Crash Data; analysis by Wood.

Included in these numbers, the county averages 0.38 reported accidents per year involving wildlife collisions, although the number of unreported wildlife accidents may be significantly higher than that.

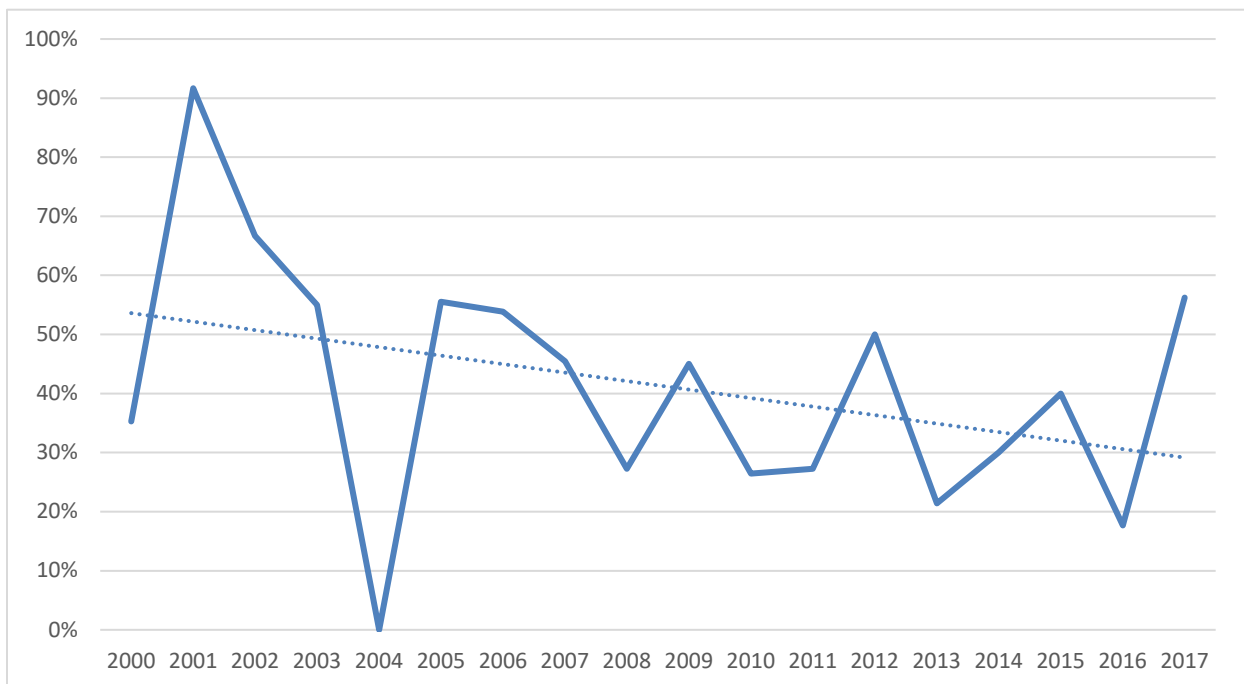
As shown in Figure 4-50, of the 305 accidents the county has experienced since 2000, 60% (183) resulted in property damage only, 115 (38%) resulted in injuries, and only 2% (7) resulted in fatalities. (Note that these numbers include the number of accidents that resulted in injuries or fatalities, not the number of individuals killed or injured.) As shown in Figure 4-51, the percentage of accidents involving injuries or fatalities has decreased slightly from roughly 50% in 2000 to approximately 30% today.

Figure 4-50 Traffic Accident Severity in Hinsdale County, 2000-2017



Source: Colorado Department of Transportation Crash Data; analysis by Wood.

Figure 4-51 Traffic Accident Severity in Hinsdale County, 2000-2017



Source: Colorado Department of Transportation Crash Data; analysis by Wood.

According to the National Transportation Safety Board (NTSB), there were four civil aviation accidents in Hinsdale County between 2000 and 2018, all involving small planes. Only one of the four involved serious

injuries or fatalities: the September 24, 2001 crash of a Piper PA-31-350 in the National Forest east of Three Sisters Peaks, which killed two people. However, even nonfatal crashes in remote areas can task the region's search and rescue capability.

Probability of Future Occurrences

Based on historical occurrences, Hinsdale County can expect to see approximately 17 traffic accidents per year, roughly 6.5 of which will result in injuries or fatalities.

Climate Change Considerations

There are no known impacts of climate change on transportation accidents.

Vulnerability

General Property

Property damage from most transportation accidents is typically limited to the vehicles involved in the accident. In severe cases, other transportation infrastructure or surrounding buildings may be damaged.

People

Transportation accidents can result in injuries or loss of life.

Critical Facilities and Infrastructure

Severe crashes can potentially impact transportation infrastructure or other nearby critical infrastructure.

Economy

Prolonged road closures can have economic impacts.

Historic, Cultural, and Natural Resources

Transportation accidents can potentially damage nearby resources and can start fires that could potentially burn significant forested areas.

Future Development

Increased development throughout Colorado can be expected to result in an increase of traffic in and through the county, which may result in more visitors and potential for transportation accidents.

Risk Summary

The overall significance of transportation accidents in Hinsdale County is Low. While these incidents occur regularly with little-to-no warning, the impacts are typically limited to the immediate area of the crash.

- Hinsdale County averages 17 traffic accidents per year, by far the lowest number of traffic accidents of any Colorado county.
- *Effects on people:* Transportation accidents can result in injuries or loss of life and limited first responders could be stressed, particularly in backcountry airplane or ATV incidents.
- *Effects on property:* Property damage from most transportation accidents is typically limited to the vehicles involved in the accident. In severe cases, other transportation infrastructure or surrounding buildings may be damaged.
- *Effects on economy:* Prolonged road closures can have economic impacts, but impacts have been limited in Hinsdale County.

- *Effects on critical facilities and infrastructure:* Severe crashes can potentially impact transportation infrastructure or other nearby critical infrastructure, but historic impacts have been limited.
- *Related Hazards:* hazardous materials, severe storms, severe winter storms.

Table 4-53 Transportation Accidents Risk Summary

Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Hinsdale County	Limited	Likely	Negligible	Low
Lake City	Limited	Likely	Negligible	Low



SECTION 5 MITIGATION STRATEGY

DMA 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 describes the mitigation strategy process and mitigation action plan for the Hinsdale County Multi-Hazard Mitigation Plan. It explains how the County and Town 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

5.1 Mitigation Strategy: Overview

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the hard work of the HMPC led to the mitigation strategy and mitigation action plan for this HMP update. As part of the plan update process, a comprehensive review and update of the mitigation strategy portion of the plan was conducted by the HMPC. As part of this process the original goals and objectives from the 2014 Plan were reviewed and reaffirmed. In general, the HMPC thought the goals are still valid but could be expanded upon with more context; the objectives for each goal were kept. The mitigation actions from 2014 Plan were reviewed and assessed for progress and evaluated for their inclusion in this plan update. Section 5.1.1 below identifies the updated goals and objectives of this plan and Section 5.3.1 details the progress on 2014 mitigation actions and summarizes the updated mitigation action plan.

5.1.1 Goals and Objectives

DMA 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

Up to this point in the planning process, the Hazard Mitigation Planning Committee (HMPC) has organized resources, assessed natural hazards and risks, and documented mitigation capabilities. A profile of the County's vulnerability to natural hazards resulted from this effort, which is documented in the preceding chapter. The resulting goals, objectives, and mitigation actions were developed based on this profile. The HMPC developed the new updated mitigation strategy based on a series of meetings and worksheets designed to achieve a collaborative mitigation planning effort, as described further in this section. The goals for this plan were developed by the HMPC based on the plan's risk assessment. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the HMPC to formulate planning goals and objectives and the mitigation strategy for Hinsdale County.



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

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

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

Based upon the risk assessment review and goal setting process, the HMPC re-assessed the following goals and associated objectives developed from the 2014 Plan. These were revisited and validated by the HMPC during the 2019 HMP update process. The number of goals and objectives did not change but each goal was expanded upon from simply 'Identify, Improve, and Reduce' to have more context based on HMPC input.

Goal 1: Identify risk and opportunities to mitigate and collaborate

Objective 1.1: Identify, introduce and implement cost effective Hazard Mitigation to accomplish the Planning Areas Goals and Objectives.

Objective 1.2: Identify Outreach Activities to raise the general population's awareness and acceptance of Hazard Mitigation.

Objective 1.3: Identify Risks that may become or already is a hazard to Hinsdale County.

Objective 1.4: Identify ways to merge multiple entity plans within the planning area.

Objective 1.5: Identify leverage building opportunities

Goal 2: Improve and expand existing mitigation capabilities

Objective 2.1: Improve mitigation strategies that will look to protect the general population of Hinsdale County from the identified hazards.

Objective 2.2: The plan will also seek to improve the County's existing mitigation capabilities.

Objective 2.3: Improve Emergency Preparedness.

Objective 2.4: Improve the County's Disaster Response and Recovery Capability.

Objective 2.5: Improve outreach activities with Residential Areas

Goal 3: Reduce the impact of hazards on populations, critical facilities, natural and historic resources, and the economy

Objective 3.1: Reduce the potential impact of natural and human-caused disasters on the populations, County's Critical Support Services.



Objective 3.2: Reduce the potential impact of natural and human-caused disasters on private property.

Objective 3.3: Reduce the potential impact of natural and human-caused disasters on the County's economy.

Objective 3.4: Reduce the potential impact of natural and human-caused disasters on the County's natural environment.

Objective 3.5: Reduce the County's liability with respect to natural and human-caused hazards generally.

Objective 3.6: Reduce the potential impact of natural and human-caused disasters on the County's specific historic treasures and interests as well as other tangible and intangible characteristics which add to the quality of life of the citizens and guests of the County.

Objective 3.7: Reduce the potential impact of natural and human-caused disasters on critical facilities and County infrastructure.

5.2 Identification and Analysis of Mitigation Actions

DMA 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.

In order to identify and select mitigation measures to support the mitigation goals, each hazard identified in Section 4: Risk Assessment was evaluated. The HMPC analyzed a comprehensive set of viable mitigation alternatives that would support identified goals and objectives. Each HMPC member was provided with the following list of categories of mitigation measures, which originate from the NFIP Community Rating System:

- **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.

The HMPC members were also provided with several lists of alternative multi-hazard mitigation actions for each of the above categories via email and at a mitigation strategy meeting in August 2019. Another reference handout document titled "Mitigation Ideas" developed by FEMA was distributed to the HMPC

via an online link. This reference provides four categories of mitigation actions that were discussed at the HMPC meeting in addition to the NFIP/CRS categories. These include:

- Plans and Regulations
- Structure and Infrastructure Projects
- Education and Awareness
- Natural systems protection

Other alternatives discussed at the meeting include the four 'A's' of mitigation:

- Alter the physical nature of the hazard
 - Such as wildfire defensible space and fuels treatments, snow fences etc.
- Avert the hazard away from people, buildings and infrastructure
 - Can include engineered solutions, drainage and channel improvements, floodproofing, fire breaks
- Adapt to the hazard
 - Through land use planning, building codes and design standards, warning systems etc.
- Avoid the hazard
 - Natural systems protection, open space, acquisition or relocation of properties out of hazardous areas

To facilitate the brainstorming process, the HMPC referred to a matrix of typical mitigation alternatives organized by CRS category for the hazards identified in the plan, in addition to a handout that explains the categories and provided examples. These materials are included in Appendix B. HMPC members were encouraged to develop mitigation alternatives that would protect future, as well as existing, development from hazards per the DMA 2000 regulations. A facilitated discussion then took place to examine the existing actions in the 2014 plan and analyze the other possible mitigation alternatives. With an understanding of the alternatives, a brainstorming session was conducted to generate a list of preferred mitigation actions. The result was a number of new and updated project ideas with the intent of meeting the identified goals and mitigating identified hazards.

5.2.1 Prioritization Process

The prioritization of mitigation actions during the 2019 update followed a similar process used during the original development of this plan. The HMPC members were provided with several sets of decision-making tools, including FEMA's recommended criteria, STAPLE/E (which considers social, technical, administrative, political, legal, economic, and environmental constraints and benefits). The STAPLE/E factors are noted in more detail below.

- Social: Does the measure treat people fairly?
- Technical: Will it work? (Does it solve the problem? Is it feasible?)
- Administrative: Is there capacity to implement and manage the project?
- Political: Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support the project?
- 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?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining project priority (the 'economic' factor of STAPLE/E). Other criteria used to recommend what actions might be more important, more effective, or more likely to be implemented than another included:

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

At the mitigation strategy update meeting the HMPC used STAPLEE considerations to determine which of the identified actions were most likely to be implemented and effective. Prioritization of previous mitigation actions identified in the 2014 HMP that are continuing in the updated plan were revisited during a HMPC meeting. New actions identified in 2019 also were prioritized based on the group discussion with the STAPLEE considerations in mind.

5.3 Mitigation Action Plan

DMA Requirement §201.6(c)(3)(iii):

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

This 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.

5.3.1 Progress on Previous Mitigation Actions

Hinsdale County and the Town of Lake City have been successful in implementing actions identified in the 2014 HMP Mitigation Strategy, thus, working diligently towards meeting the 2014 plan goals. Table 5-1 indicates the details for each 2014 mitigation action items that have been completed or were deleted during the 2019 update process. During the 2019 update of the plan, the HMPC acknowledged that some actions should not be carried forward.

The 2014 mitigation strategy contained 18 separate mitigation actions. As of September 2019, three of these actions have been completed, two have been deleted and 12 are considered continuing-in process. Many of the continuing-in process actions include actions that are implemented on a regular or annual basis that contribute to the goals of this plan that will continue to be needed into the future. These include public hazard awareness and outreach campaigns, including continuing to encourage property owners to purchase flood insurance. Table 5-2 provides a status summary of the mitigation action projects completed from the 2014 Plan. Some of the deferred items including projects that will continue forward



in the plan and include a mix of projects with some progress and ongoing implementation and others that have been deferred due lack of funding or other priorities.

5.3.2 Updated Action Plan

The results of the project identification and prioritization exercise are summarized in Table 5-2. These projects detail specific actions for reducing future hazard-related losses within Hinsdale County and Lake City. The projects are grouped by the hazards that the projects are intended to mitigate. Included are the affected jurisdiction(s) and notes about the department and partners necessary to implement the project. Also included are the goal(s) that the projects primarily align with, with an understanding that some projects may help to achieve more than one goal. The mitigation projects are marked with their relative level of priority high, medium, and low.

Many of these mitigation actions are intended to reduce impacts to existing development. Those that protect future development from hazards, as required per the DMA 2000 regulations, are indicated by an asterisk '*' in the action identification number. These actions include those that promote wise development and hazard avoidance, such as building code, mapping, and zoning improvements, and continued enforcement of floodplain development regulations.



Table 5-1 Hinsdale County Completed or Removed Mitigation Actions

Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
Adopt/Update the International Building Code (IBC).	1.4, 2.1, 2.2, 3.2, 3.3,	Flooding, Wildfire, Severe, Winter storm, Severe, Thunderstorm Activity, Avalanche, Landslide, Drought, Dam Incident, Earthquake	M	Hinsdale County Government	Completed in 2015	The 2012 version of the IBC was adopted in 2015
Developing a dam failure study and emergency action plan. (Complete Flash Flood Protocol and Procedure Plan)	1.1, 1.2, 1.3, 1.5, 2.1, 2.3, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Flooding, Dam/ Reservoir Failure	H	Hinsdale County/ Lake City Government	Completed in 2019	This was completed in 2019 as part of flood preparedness efforts
Incorporate Code-Red Emergency Communications throughout the County	1.1, 1.2, 2.3, 2.4, 3.5	All Hazards	H	Hinsdale County Government	Completed	
Work with Floodplain Manager to identify and pursue actions that improve the Community Rating System (CRS) rating.	1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.5, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Flooding, Dam Incident	H	Hinsdale County Government	Deleted	County was never a CRS participant. Replaced with new action to evaluate the cost/benefit of joining the CRS.



Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
Reduce damage in sloping areas, such as stabilization, energy dissipation, and flow control measures. Install catch-fall nets for rocks at steep slopes near roadways.	1.1, 1.3, 1.4, 1.5, 2.1, 2.2, 3.1, 3.3, 3.4, 3.5	Landslide, Avalanche	H	Hinsdale County, CDOT	Deleted	Project too vague; replaced with new actions with specific roadway locations



Table 5-2 Hinsdale County Mitigation Action Summary Table

ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
1*	Update the county and municipal Land Use & Building Codes and Development Regulations to Mitigate natural hazards	1.1, 1.3, 1.4, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Flooding, Wildfire, Severe Winter storm, Severe Thunderstorm Activity, Avalanche, Landslide, Drought, Dam Incident, Earthquake	High	Hinsdale County/ Lake City Government	2020-2023	Continuing – Partial Implementation - Additional effort is needed to review and update the 1979 Land Use Code in regard to hazards - see also action item Update the county and municipal Comprehensive Plans to address natural hazards and Adopt/Update the International Building Code (IBC).
2	Based on a wildfire vulnerability assessment, coordinate private lands hazardous fuels reduction projects identified in Hinsdale County CWPP.	1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Wildfire	High	Hinsdale County, Colorado State Forest Service, West Region Wildfire Council, Gunnison Basin Wildfire Council, Wildfire Adapted Partnership (WAP)	Annual Implementation	Continuing – Partial Implementation - Ptarmigan Meadows vulnerability assessment and plan completed in 2018 – funded by RWEACT and the West Region Wildfire Council - Several local subdivisions have worked with CSFS / identified projects to implement - In south Hinsdale, residents have the opportunity to partner with Wildfire Adapted Communities nonprofit organization. - Current (2019) implementation of the Rocky Mountain Restoration Initiative may help reduce wildfire risk.



ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
3	Coordinate and partner on fire mitigation projects on federal lands identified in the CWPP and federal forest management plans.	1.1, 1.4, 1.5, 2.1, 2.2, 2.3, 3.2, 3.4, 3.5	Wildfire, Flooding	Medium	Hinsdale County, Colorado State Forest Service, USDA Forest Service, BLM, Rocky Mountain Restoration Initiative	Annual Implementation	Continuing – Partial Implementation - Participate as appropriate in proposed Rocky Mountain Restoration Initiative demonstration projects in the Southwest Region - Continue to participate in Forest Plan revision processes for all public land partners including the Rio Grande National Forest, Grand Mesa Uncompahgre Gunnison (GMUG) National Forest, and the Gunnison Field Office of the BLM. Implement the updated San Juan National Forest Plan. - Action title revised in 2019 - Review, update and implement the Ptarmigan Meadows CWPP plan; partner and assist subdivision plans



ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
4	Utilize Emergency Management and Fire District Management and regional partners to educate local governments, builders, architects and other stakeholders about Firewise construction techniques, materials, and private contractors who are able to complete Firewise prevention projects on homeowners' properties.	1.1, 1.2, 1.5, 2.1, 2.5, 3.2, 3.3, 3.5	Wildfire	High	Hinsdale County, Lake City Fire District, in partnership with Colorado State Forest Service and regional nonprofit organization (WRWC, GBC, WAP),	Annual Implementation	Continuing – Partial Implementation - Partners include West Region Wildfire Council, Gunnison Basin Wildfire Council, Wildfire Adapted Partnership - The Colorado State Forest Service have capabilities to provide parcel-based risk assessments and work with HOAs on recommended improvements to reduce risk.
5*	Continue participation in the National Flood Insurance program by continuing to enforce floodplain development, incentive-based measures, including regulating new construction in Special Flood Hazard Areas, adopting updated maps, and by continuing to encourage property owners to purchase flood insurance.	1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.5, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Flooding, Dam Incident	Medium	Hinsdale County Government/ Lake City Government	Annual Implementation	Continuing – Annual Implementation - Hinsdale County and Lake City will be receiving updated flood hazard maps through the CWCB and RiskMAP program. The new maps will be available in 2020 and will need to be adopted. - Review the floodplain management ordinances for possible updates following adoption of new mapping. - The County encouraged flood insurance as part of the 2019 flood preparedness efforts.

ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
6	Evaluate current hazard mitigation education/outreach efforts and develop an outreach strategy for planning area. Educate property owners regarding options for mitigating their properties from Identified Hazards.	1.1, 1.2, 2.1, 2.3, 2.5, 3.2, 3.3, 3.4, 3.5	Flooding, Wildfire, Severe Winter storm, Severe Thunderstorm Activity, Avalanche, Landslide, Drought, Dam Incident, Earthquake	High	Hinsdale County/ Lake City Government, Lake City Fire District, Lake City School District	Annual implementation	Continuing – Partial Implementation Effort has been made on flood, wildfire, and avalanche, Dam Incident, particularly in 2019 with the severe winter weather, avalanche activity, and flood concerns; flood insurance was also promoted.
7	Procure, upgrade and maintain backup power generators in all critical facilities identified in the Mitigation Plan.	1.1,1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.3, 3.5	Wildfire, Severe Winter storm, Severe Thunderstorm Activity, Avalanche, Landslide, Earthquake, Utility Failure	High	Hinsdale County/ Lake City Government	2019-2021	Continuing – Partial Implementation - County has maintained generators at facilities including the Sherriff's Office; electrical work to extend the backup power capabilities to the Coursey Annex (serves as EOC) and Administration offices are still needed. - Lake City Town Hall and Armory are also being evaluated for a generator in 2019 - The School District may also need one as the school functions as an emergency shelter.
8	Assure that lightning protection devices are adequate for critical facilities identified in the Mitigation Plan.	1.1, 1.4, 2.2, 2.3, 2.4, 3.4, 3.5	Severe Thunderstorm Activity	High	Hinsdale County/ Lake City Government	1 year, \$10,000	Continuing – Partial Implementation Hill Seventy-One communications infrastructure improvements have been done but need to be re-evaluated for effectiveness.



ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
9	Adopt ArcGIS capabilities within the planning area to develop a comprehensive mapping program for emergency services and Identified Hazards.	1.1, 1.2, 1.3, 1.5, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Avalanche, Dam Incident, Earthquake, Flooding, Landslide, Wildfire	Medium	Hinsdale County/ Lake City Government	2-3 Years, \$30,000-\$50,000	Continuing – Partial Implementation - Risk MAP process will provide digital flood hazard products in 2020 - Additional GIS data developed as part of 2019 flood preparedness and hazard mitigation plan update - Parcel mapping effort being completed in 2019-2020 with help from a consultant
10*	Offering GIS hazard mapping data online for emergency services, residents and design professionals.	1.1, 1.2, 1.3, 1.5, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Avalanche, Dam Incident, Earthquake, Flooding, Landslide, Wildfire	Low	Hinsdale County/ Lake City Government	3-5 years, \$20,000	Continuing – no progress County will reconsider this when additional hazards mapping data and parcel data become available
11*	Update the county and municipal Comprehensive Plans to address natural hazards.	1.1, 1.4, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.3, 3.5, 3.6, 3.7	Avalanche, Dam Incident, Drought, Earthquake, Flooding, Landslide, Severe Thunderstorm Activity, Severe Winter storm, Wildfire	Medium	Hinsdale County/ Lake City Government	2019-2023	Continuing – no progress This could be partly achieved through cross referencing the Hazard Mitigation Plan as the source of hazard information during the next update of these plans and referencing the HMP Risk Assessment for hazards information to inform planning decisions.



ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
12	Evaluate Opportunities to improve reliability and coverage of emergency services communications systems	1.1, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 3.5	Avalanche, Dam Incident, Drought, Earthquake, Flooding, Landslide, Severe Thunderstorm Activity, Severe Winter storm, Wildfire, Imminent Threat, Hazardous Materials Incidents, Pandemics, Utility Failure, Transportation Accidents	Medium	Hinsdale County Government – Sheriff and Emergency Management	2019-2023	Continuing – Partial Implementation - Hill Seventy-One communications infrastructure improvements have included hardened power lines - Installation of outdoor siren plus two satellite sirens completed - Use of IPAWs system - Development of evacuation zones / outreach with neighbor-to-neighbor communication / HOA calling notifications - Could explore partnership with Lake City and Archuleta County
13	Continue to develop responsible water conservation programs for residential and business consumers and to prioritize water use for emergency situations.	1.1, 1.2, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Drought, Wildfire	High	Town of Lake City Government/ Lake Fork Valley Conservancy	Ongoing, 1-5 Years, \$2.5 Million Infrastructure Upgrade	Continuing – Partial Implementation - The Town passed an emergency ordinance during drought in 2017. - Town has drilled a new well. - A water line improvement project was completed in spring 2018 and has reduced leaks and increased water efficiency. - Backflow prevention devices are being installed in local businesses to prevent water being siphoned back into system.



ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
N-1	Evaluate the adoption of the 2015 IBC construction provisions and wildfire provisions	1.4, 2.1, 2.2, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Flooding, Wildfire, Severe Winter storm, Severe Thunderstorm Activity, Avalanche, Landslide, Drought, Dam Incident, Earthquake	Medium	Hinsdale County Government	2020	New in 2019
N-2	Obtain a chipper for the landfill and establish a chipping program to reduce wildfire fuel loads and encourage defensible space	3.2	Wildfire	Medium	Hinsdale County Government	2020-2023	New in 2019 Explore options to potentially fund a wood chipper – fuel risk reduction program
N-3	Evaluate the County burn restriction ordinance to consider limits on recreational burns during times of drought or heightened wildfire risk	2.2, 3.1, 3.4	Wildfire, Drought	Medium	Hinsdale County Government	2020-2023	New in 2019
N-4*	Update the County Community Wildfire Protection Plan	2.2, 1.4	Wildfire	Medium	Hinsdale County Government	2020-2023	New in 2019 The plan was completed in 2008 and is in need of an update.



ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
N-5	Evaluate the cost/benefit of joining the National Flood Insurance Program Community Rating System (CRS) to assist with flood insurance affordability	1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.5, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Flooding, Dam Incident	Low	Hinsdale County Government, Lake City	2020-2023	New in 2019 Hinsdale County and Lake City will review the potential benefits and costs of joining the CRS - This review should occur following adoption of new mapping, which may create situations where flood insurance is required where there wasn't before. - The County has already been doing many activities related to CRS including encouraging flood insurance as part of the 2019 flood preparedness efforts.
N-6	County Road 30 drainage improvements and debris flow mitigation	3.7	Flooding, landslide	High	Hinsdale County Government, in partnership with Colorado Geological Survey	2020-2023	New in 2019 County Road 30 and is part of the Alpine Loop and OHV pilot route. It has been impacted by multiple flood and debris flow incidents. An area on Cinnamon Pass has slid 7 times in the last 30 years according to Road and Bridge, including an incident in August 2019 that stranded approximately 40-60 people for several hours that resulted in rescue. This project would identify high priority areas that could be candidates for culvert and drainage improvements or debris basins and implementation of the improvements. The CGS has offered assistance in the hazard evaluation in 2019



ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
N-7	County Road 20 rockfall and debris flow mitigation	3.7	Flooding, landslide	High	Hinsdale County Government	2020-2023	New in 2019 County Road 20 and is part of the Alpine Loop and OHV pilot route. It has been impacted by multiple rockslides that periodically close the road and potentially affect motorist safety. This project would identify high priority areas that could be candidates for culvert and drainage improvements or debris basins. The CGS has offered assistance in the hazard evaluation in 2019
N-8	Develop a Capital Improvement Plan to formally identify road and bridge blockage and drainage issues	1.3, 1.4, 3.1	Flooding, landslide	High	Hinsdale County Government	2020-2023	New in 2019 Evaluate all roads and bridges for drainage and blockage issues and mitigation options, funding sources, and timelines.



ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
N-9*	Evaluate avalanche hazard mitigation options to protect existing and future buildings and infrastructure on private and federal lands	1.5, 3.7	Avalanche	High	Hinsdale County Government, Lake City, CAIC, CGS, BLM, USFS	2019-2020	New in 2019 The planning commission is evaluating the potential options for mitigating avalanche impacts to existing road infrastructure and built areas, including review of mitigation programs in other mountain counties (Pitkin et. al.). Other activities will include training Avalanche Observers; send Road and Bridge staff to the annual training with CDOT, develop a general fact-sheet and then over the course of the next several years, determine how best to address any new development.
N-10	Evaluate the potential for an avalanche control program with CDOT and CAIC	1.5, 3.7	Avalanche	High	Hinsdale County Government, Lake City, CDOT, CAIC, CGS, BLM, USFS	2019-2020	New in 2019 This project would explore the possibility of a more formal avalanche monitoring and control program with assistance from CDOT and CAIC to reduce future large avalanche impacts on Hwy 149 and possibly County Roads 20 and 30.
N-11	Develop and implement an avalanche safety program for Hinsdale County Road & Bridge Department to include mapping, scouting, site evaluation, and training with rescue equipment.	3.1, 3.7	Avalanche	High	Hinsdale County Government, Lake City, CDOT, CAIC, CGS, BLM, USFS	2019-2020	New in 2019



ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
N-12	Develop general guidance for property owners with regards to Avalanche Hazards or professional assistance to access; provide training for volunteer Avalanche Observers;	1.2, 2.5, 3.2	Avalanche	High	Hinsdale County Government, Lake City, CDOT, CAIC, CGS, BLM, USFS	2019-2020	New in 2019 Develop process for chain of information regarding specific properties; and identify steps to take for new development.
N-13	Investigate the potential need and options to expand NOAA all-hazards weather radio in the County	1.1, 1.5, 2.2, 2.3, 2.5	Avalanche, Dam Incident, Drought, Earthquake, Flooding, Landslide, Severe Thunderstorm Activity, Severe Winter storm, Wildfire, Imminent Threat, Hazardous Materials Incidents, Pandemics, Utility Failure, Transportation Accidents	Low	Hinsdale County, NOAA - National Weather Service	2020-2023	New in 2019 This project would explore the cost/benefit of expanded NOAA all-hazards weather radio coverage as an enhancement to warning capabilities.
N-14	Install a generator on the Armory building (which functions as a Red Cross Shelter) to ensure power during emergencies and hazard events.	1.1, 1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.3, 3.5	Wildfire, Severe Winter storm, Severe Thunderstorm Activity, Avalanche, Landslide, Earthquake, Utility Failure	High	Lake City; Red Cross	2021 depending on funding; \$20,000 generator \$12,000 electrical	New in 2019 Generator pad is in place as of 2019 and bids have been sought to ensure adequate sized generator and hookups.



ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
N-15	Implement well and water supply protection from flooding on Henson Creek	3.7	Flooding	High	Lake City	2019-2021; cost TBD depending on solution	New in 2019 Two wells that provide the water supply for the Town are located in the floodplain of Henson Creek. The well infrastructure was sandbagged in anticipation of flooding in 2019. This project would evaluate and implement long-term, permanent solutions to reduce the risk as well as reducing the need for emergency protective measures.
N-16	Install avalanche mitigation above electrical substation and house on the east side of Lake City	1.5, 3.2, 3.7	Avalanche	Medium	Lake City, Gunnison County Electric	2019-2020; Cost TBD	New in 2019 Avalanches have impacted an electric substation in the past on the east side of Lake City (Buttercup Ln) as well as a home; the potential for avalanche risk has been increased in part by wildfire mitigation beneath power lines in the area. This project would identify and implement potential mitigation that may include snow fences or anchors to prevent future slides.



ID	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments
N-17	Install a system of culverts and drainage improvements to mitigate debris flow in the vicinity of Ball Flats/ 8 th street and also protect the sewer plant	3.7	Landslide/Debris flow, Flooding	Medium	Lake City	2019- 2021; Cost TBD	New in 2019 A drainage problem is causing mudslides in the ball flats area on 8 th street; the Town has had engineers do a preliminary evaluation of the site and recommended improvements that include improving culverts and routing drainage. The project would also reduce risk to the Town's sewer treatment infrastructure in this area.

*Mitigates impacts to future development



SECTION 6 PLAN ADOPTION

DMA Requirements §201.6(c)(3):

[The local hazard mitigation plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, county commissioner, Tribal Council).

The purpose of formally adopting this plan is to secure buy-in from Hinsdale County and the Town of Lake City, raise awareness of the plan, and formalize the plan's implementation. The adoption of this plan completes Planning Step 9 of the 10-step planning process: Adopt the Plan. The governing board for each participating jurisdiction has adopted this local hazard mitigation plan by passing a resolution. A copy of the generic resolution and the executed copies are included in Appendix C: Plan Adoption.



SECTION 7 PLAN IMPLEMENTATION AND MAINTENANCE

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This is Planning Step 10 of the 10-step planning process. This chapter provides an overview of the overall strategy for plan implementation and maintenance, and outlines the method and schedule for monitoring, updating, and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

7.1 Implementation

DMA 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.

Once adopted, the plan faces the truest test of its worth: implementation. While this plan contains many worthwhile actions, the participating jurisdictions will need to decide which action(s) to undertake first. Two factors will help with making that decision: the priority assigned the actions in the planning process and funding availability. Low or no-cost actions most easily demonstrate progress toward successful plan implementation.

Implementation will be accomplished by adhering to the schedules identified for each mitigation action in Table 5-2 in Section 5 Mitigation Strategy, and through pervasive efforts to network and highlight the multi-objective, win-win benefits of each project to the Hinsdale County community and its stakeholders. These efforts include the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Implementation will be accomplished by adhering to the schedules identified for each action and through constant, pervasive, and energetic efforts to network and highlight the multi-objective, win-win benefits to each program and the Hinsdale County community and its stakeholders. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and vigilant review of programs for coordination and multi-objective opportunities.

Simultaneously 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, should grants be pursued. When funding becomes available, the participating jurisdiction's will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, special district budgeted funds, state and federal earmarked funds, and other grant programs, including those that can serve or support multi-objective applications.



7.1.1 Role of the Hazard Mitigation Planning Committee in Implementation and Maintenance

With adoption of this plan, Hinsdale County and the Town of Lake City will be tasked with plan implementation and maintenance. The participating jurisdictions, led by the Hinsdale County Administrator, agree 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/no-cost recommended actions;
- 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;
- Maintain a monitoring of multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Report on plan progress and recommended changes to the Hinsdale Board of County Commissioners, Town Council, and other partners; and
- Inform and solicit input from the public.

Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the County and Town website and in the local newspaper.

7.2 Maintenance/Monitoring

DMA Requirement §201.6(c)(4)(i):

[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.

Plan maintenance implies an ongoing effort to monitor and evaluate plan implementation and to update the plan as required or as progress, roadblocks, or changing circumstances are recognized.

7.2.1 Maintenance/Monitoring Schedule

In order to track progress and update the mitigation strategies identified in the action plan, the HMPC will revisit this plan at the following times or occurrences:

- Annually, to assess if projects have been completed;
- Following a significant hazard event;
- Following a disaster declaration;
- Any other time the HMPC sees it is prudent or necessary.

County emergency management will facilitate these reviews.

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. Efforts to begin the update should begin no later than June 2023. The County will monitor planning grant opportunities from the Colorado Division of Homeland Security and Emergency Management (DHSEM) and FEMA for funds to assist with the update. This may include submitting a Pre- Disaster Mitigation planning grant application. This grant should be



submitted in 2022, as there is a three-year performance period to expend the funds, and there is no guarantee that the grant will be awarded when initially submitted. This allows time to resubmit the grant in subsequent years, if needed. Updates to this plan will follow the most current FEMA and DHSEM planning guidance. The next plan update should be completed and reapproved by DHSEM and FEMA Region VIII by January 2025. The HMPC members and those entities identified in Appendix A, will be reconvened for this process by Hinsdale County Emergency Management.

7.2.2 Maintenance Evaluation Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Such changes in vulnerability may include:

- 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).

The HMPC will use the following process to evaluate progress, note changes in vulnerability, and consider changes in priorities as a result of plan implementation:

- A representative from the responsible entity identified in each mitigation measure will be responsible for tracking and reporting the MAC Group/HMPC when project status changes. The representative will provide input on whether the project as implemented meets the defined goals objectives and is likely to be successful in reducing vulnerabilities.
- If the project does not meet identified goals and objectives, the MAC Group/HMPC will select alternative projects for implementation.
- New projects identified will require an individual assigned to be responsible for defining the project scope, implementing the project, monitoring success of the project.
- Projects that were not ranked high priority but were identified as potential mitigation strategies will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation.
- Changes will be made to the plan to accommodate for projects that have failed or are not considered feasible after a review for their consistency with established criteria, the time frame, priorities, and/or funding resources.

Updates to this plan will:

- Consider changes in vulnerability due to project implementation,
- A comprehensive review of plan goals and objectives
- 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,
- Document hazard events and impacts that occurred within the five-year period,
- Incorporate new data or studies on hazards and risks,
- Incorporate new capabilities or changes in capabilities,
- Document continued public involvement
- Document changes to the planning process, which may include new or additional stakeholder involvement
- Incorporate growth and development-related changes to building inventories,



- Incorporate new project recommendations or changes in project prioritization,
- Include a public involvement process to receive public comment on the updated plan prior to submitting the updated plan to DHSEM/FEMA, and
- Include re-adoption by all participating entities following DHSEM/FEMA approval.

7.2.3 Incorporation into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other jurisdictional plans and mechanisms. Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. As stated in Section 7.1 of this plan, implementation through existing plans and/or programs is recommended, where possible. This point is re-emphasized here and is also captured in the Goal 1 Objective 1.4 “Identify ways to merge multiple entity plans within the planning area.” Based on this plan’s capability assessment and progress made on mitigation actions noted in Chapter 5, the one participating jurisdiction has and will continue to implement policies and programs to reduce losses to life and property from natural hazards. The 2013 Hazard Mitigation Plan was referenced in the update of the Emergency Operations Plan and recognizes the HMP as a source for hazard information. Lake City has not yet referenced or incorporated the 2013 HMP in other planning mechanisms, but an opportunity exists moving forward to reference the plan within the next update of the Capital Improvements Plan. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing projects, where possible, through these other program mechanisms. These existing mechanisms include:

- Hinsdale County and Town of Lake City Community Plan
- Hinsdale County Community Wildfire Protection Plan
- Town of Lake City Capital Improvements Plan

A process for HMPC members involved in the updates to these mechanisms in this plan’s mitigation strategy in Chapter 5. Action 15 “Update the county and municipal Comprehensive Plans to address natural hazards” outlines the strategy for cross referencing the Hazard Mitigation Plan as the source of hazard information during the next update of these plans and referencing the HMP Risk Assessment for hazards information to inform planning decisions. Action N-4 discusses the update of the County Community Wildfire Protection Plan which will provide another opportunity to incorporate and synchronize wildfire mitigation actions. The HMPC will be responsible for integrating the findings and recommendations of this plan with these other plans, as appropriate. The mitigation plan can be considered as a “hub on the wheel” with spokes radiating out to other related planning mechanisms that will build from the information and recommendations contained herein.

7.2.4 Continued Public Involvement

Continued public involvement is also imperative to the overall success of the plan’s implementation. The update process provides an opportunity to publicize success stories from the plan implementation and seek additional public comment. A public hearing(s) to receive public comment on plan maintenance and updating will be held during the update period. When the HMPC reconvenes for the update, they will coordinate with all stakeholders participating in the planning process—including those that joined the committee since the planning process began—to update and revise the plan. The plan maintenance and



update process will include continued public and stakeholder involvement and input through participation in designated committee meetings, surveys, web postings, and press releases to local media.



APPENDIX A: HMPC MEMBERS

Agency/ Jurisdiction	Title	Name	Participating Jurisdiction	Stakeholder	Meetings ¹ Attended
Hinsdale County					
Administration Office	Administrator	Jami Scroggins	X		Kick-Off; Mtg #2; Mtg #3
Administration Office	Administrative Assistant	Sandy Hines	X		Kick-Off; Mtg #2; Mtg #3
Assessor's Office	Assessor	Luke de la Parra	X		
Board of County Commissioners	Commissioner – District 2	Kristie Borchers	X		Kick-Off; Mtg #2, Mtg #3
Board of County Commissioners	Commissioner – District 3	Stan Whinnery	X		
Board of County Commissioners	Commissioner – District 1	Susan Thompson	X		
Building Department	Building Official (County and Town)/ Floodplain Admin.	Richard Kimball	X		Kick-Off; Mtg #3
County Clerk	County Clerk	Joan Roberts	X		
Emergency Services	Emergency Manager (contract support)	Phil Graham	X		Mtg #2; Mtg #3
Road and Bridge	Road and Bridge Supervisor	JoAllen Blowers	X		Mtg #2;
Sheriff's Department	Sheriff	Justin Casey	X		Kick-Off; Mtg #2; Mtg #3
Treasurer	Treasurer	Lori Lawrence	X		
Veterans' Services	Director	Erin Cavit	X		
Town of Lake City					
Administration	Town Manager	Caroline Mitchell	X		
Administration	Town Mayor	Bruce Vierheller	X		Mtg #2
Public Works	Director	Greg Levine	X		
Recreation	Director	Ben Hake	X		
Town Clerk	Clerk	Jamie Turrentine	X		
Special Districts					
Public Health	Health Educator	Kristen Hartje		X	Kick-Off; Mtg #2
Public Health	Director	Tara Hardy		X	Mtg #3
Lake City Area Medical Center	Director	Dr. Gina Carr		X	Mtg #2
Hinsdale County's Wildland Fire Response Team		Richard Hernandez		X	Kick-Off
Lake City Area Fire Protection District	Fire Chief	Bill Hagendorf		X	

¹ Those that are not listed as attending a meeting participated in the planning process in other ways such as emails, phone calls and face-to-face meetings with the County Project Manager and consultants.

Agency/ Jurisdiction	Title	Name	Participating Jurisdiction	Stakeholder	Meetings ¹ Attended
Lake City Community School/Hinsdale County School District	Superintendent	Rebecca Hall		X	
Lake City National Historic District		Grant Houson		X	
State Agencies					
CO DHSEM	Field Manager	Drew Petersen		X	Kick-Off; Mtg #2
CO DHSEM	Planner	Mark Thompson		X	Kick-Off; Mtg #2; Mtg #3
CO DHSEM	Planning Program Manager	Patricia Gavelda		X	
CO Division of Water Resources – Dam Safety	State Engineer	Bill McCormick		X	
CDOT	TM II	Robert Hall		X	Mtg #2
CO Geological Survey	State Geologist	Karen Berry			
Neighboring Counties					
Archuleta County	Emergency Manager	Mike Le Roux		X	
Gunnison County	Emergency Manager	Scott Morrill		X	
Mineral County	Emergency Manager	Terry Wetherill		X	
La Plata County	Emergency Manager	Butch Knowlton		X	
Ouray County	Emergency Manager	Glenn Boyd		X	
San Juan County	Emergency Manager	Jim Donovan		X	
Saguache County	Emergency Manager	Bobby Woelz		X	
Local Non-Profits					
Lake Fork Valley Conservancy District	Executive Director	Camille Richard		X	
Other					
Wood Environment and Infrastructure Solutions, Inc. (consultant)	Project Manager	Jeff Brislawn			
Wood	Sr. Planner	Scott Field			
Wood	Planner	Amy Carr			
Wood	GIS Specialist/ Planner	Marta Blanco Castano			

APPENDIX B: PLANNING PROCESS DOCUMENTATION

From: Troy Mead <emergency@hinsdalecountycolorado.us>
Sent: Monday, April 01, 2019 2:28 PM
To: Jami Scroggins; Kristie Borchers; carolinemitchell@townoflakecity.co; Richard Kimball; Richard Hernandez; Justin Casey; Tara Hardy
Cc: markw.thompson@state.co.us; Brislawn, Jeff P
Subject: HMP

Greetings,

Hinsdale County is initiating the process for the update of the Hinsdale County Multi-Jurisdictional Hazard Mitigation Plan. The plan is being updated in accordance with the Disaster Mitigation Act of 2000 and the required 5 year update cycle. The County is leading the hazard mitigation planning effort that will include Lake City and other interested special districts. The purpose of this plan is to reduce or eliminate long-term risk to the people and property of the County and region from the effects of hazard events. In addition to local governments, the County is inviting stakeholders to participate in the plan development process. Stakeholders include representatives from other local, state or federal government agencies that may have significant interest in the County, or that have information to support the planning process. Stakeholders also include representatives from key business, industry, nonprofit organizations, and the public.

As a potential local government jurisdiction or stakeholder you are invited to participate in this planning process. The work will be coordinated by our County Hazard Mitigation Planning Committee (HMPC), which includes representatives from the County, Lake City, and assisted by Wood Environment & Infrastructure's professional planning services. Three planning team workshops over the next 6 months are anticipated; the goal is to produce a final draft for FEMA review in September 2019. You are welcome to send a representative to some or all of the meetings, or stay informed via an email distribution list.

You are invited to the first of three planning meetings:

Workshop 1: Kickoff Meeting
Date: Thursday April 11, 2019
Time: 2:00 pm
Location: Two Be Announced

As a stakeholder there are various ways to participate in the planning process, either by contributing input at meetings, being aware of planning activities through an email group, providing information to support the effort, or reviewing and commenting on the draft plan. Please respond as to whether or not you are interested in participating, and if you or your representative will be able to attend any of the meetings by contacting me.

Troy S. Mead NREMT-P, C-CEM
Director of Emergency Management & EMS
Hinsdale County Colorado
311 N. Henson St.
Box 277, Lake City, CO 81235
Contact: (970) 944-2806
emergency@hinsdalecountycolorado.us

The Most Dangerous phrase in the Language is "We've always done it this way."

Emergency preparedness starts with you

be prepared



make a plan



build a kit



stay informed

From: Kristie Borchers <district2@hinsdalecountycolorado.us>
Sent: Friday, April 05, 2019 1:51 PM
To: Troy Mead; Jami Scroggins; carolinemitchell@townoflakecity.co; Richard Kimball; Richard Hernandez; Justin Casey; Tara Hardy
Cc: markw.thompson@state.co.us; Brislawn, Jeff P
Subject: Re: HMP

Just a reminder, we will be having this kick-off meeting for the All-Hazard Mitigation plan next Thursday at 2:00 p.m. at Coursey Annex.

This is our five-year update; we look forward to working with you all to accomplish this task for our community and to incorporate many of the lessons we just learned □

Respectfully,
Kristie Borchers
Commissioner
District 2
970-596-9071
district2@hinsdalecountycolorado.us

From: Troy Mead
Sent: Monday, April 1, 2019 2:28 PM
To: Jami Scroggins; Kristie Borchers; carolinemitchell@townoflakecity.co; Richard Kimball; Richard Hernandez; Justin Casey; Tara Hardy
Cc: markw.thompson@state.co.us; Brislawn, Jeff P
Subject: HMP

Greetings,

Hinsdale County is initiating the process for the update of the Hinsdale County Multi-Jurisdictional Hazard Mitigation Plan. The plan is being updated in accordance with the Disaster Mitigation Act of 2000 and the required 5 year update cycle. The County is leading the hazard mitigation planning effort that will include Lake City and other interested special districts. The purpose of this plan is to reduce or eliminate long-term risk to the people and property of the County and region from the effects of hazard events. In addition to local governments, the County is inviting stakeholders to participate in the plan development process. Stakeholders include representatives from other local, state or federal government agencies that may have significant interest in the County, or that have information to support the planning process. Stakeholders also include representatives from key business, industry, nonprofit organizations, and the public.

As a potential local government jurisdiction or stakeholder you are invited to participate in this planning process. The work will be coordinated by our County Hazard Mitigation Planning Committee (HMPC), which includes representatives from the County, Lake City, and assisted by Wood Environment & Infrastructure's professional planning services. Three planning team workshops over the next 6 months are anticipated; the goal is to produce a final draft for FEMA review in September 2019. You are welcome to send a representative to some or all of the meetings, or stay informed via an email distribution list.

You are invited to the first of three planning meetings:

Workshop 1: Kickoff Meeting

Date: Thursday April 11, 2019

Time: 2:00 pm

Location: Two Be Announced

As a stakeholder there are various ways to participate in the planning process, either by contributing input at meetings, being aware of planning activities through an email group, providing information to support the effort, or reviewing and commenting on the draft plan. Please respond as to whether or not you are interested in participating, and if you or your representative will be able to attend any of the meetings by contacting me.

Troy S. Mead NREMT-P, C-CEM

Director of Emergency Management & EMS

Hinsdale County Colorado

311 N. Henson St.

Box 277, Lake City, CO 81235

Contact: (970) 944-2806

emergency@hinsdalecountycolorado.us

The Most Dangerous phrase in the Language is "We've always done it this way."



HINSDALE COUNTY HAZARD-MITIGATION PLAN UPDATE

KICKOFF MEETING

Thursday, April 11th, 2019

2:00 to 4:00 pm

Coursey Annex Meeting Room 311 Henson St, Lake City, CO

- 1. Introductions**
- 2. Hazard Mitigation Overview – CO DHSEM**
- 3. Hazard Mitigation Planning Process and Requirements**
- 4. Role of the Hazard Mitigation Planning Committee**
- 5. Plan Update Requirements, Key Elements, and Schedule**
- 6. Review of Identified Hazards and 2014 Mitigation Plan**
- 7. Coordinating with Other Agencies/Related Planning Efforts**
- 8. Initial Information Needs**
- 9. Questions and Answers/Adjourn**

**SIGN-IN SHEET
HINSDALE COUNTY
LOCAL HAZARD MITIGATION PLAN UPDATE PROJECT
HMPC #1 – Kickoff Meeting**

Thursday April 11th, 2019 @ 2:00-4:00pm
Coursey Annex Meeting Room 311 Henson St, Lake City, CO

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail
Carline Mitchell	TOLL			
Sandy Hues	Hinsdale County			
Richard Kimball	Hinsdale County			
Kristen Hartje	Hinsdale County PH			
Tara Hardy	Public Health			
Justin Casey	Hinsdale S.O.			
Mark Thompson	CO Div. of Homeland Security			
Jeff Briskawn	Project Manager			
Scott Field	Sr. Planner			
Amy Carr	Haz. Mit. Planner			
Marta Blanco Castano	GIS			
Jami Scroggs	County Administrator			
Rick Hernandez	HCSO WFR			

on
phone

Drew Petersen COEM
Kristie Borders BOCC

Hinsdale County Multi-Jurisdictional Hazard Mitigation Plan 2019 Update

Kick-Off Meeting/Webinar Summary

2-4 pm

April 11, 2019

Coursey Annex Meeting Room
311 Hensen St., Lake City, CO

Introductions and Opening Remarks

This document summarizes the kickoff meeting for the Hinsdale County Hazard Mitigation Plan update for 2019. The meeting was a combination in-person meeting with a webinar/conference call facilitated by Wood Environment & Infrastructure Solutions, Inc. (Wood), the consulting firm hired to facilitate the planning process and develop the updated County plan. Jeff Brislawn, project manager at Wood, began the meeting with introductions. Jeff first introduced the other members the Wood team and Mark Thompson of the Colorado Division of Homeland Security & Emergency Management (DHSEM), all of whom attended remotely. Drew Peterson of DHSEM, was also present in person at the meeting. Jeff then asked those at the meeting in person to introduce themselves. Ten (10) persons representing a mix of county departments and the Town of Lake City were present and documented on a sign-in sheet. County representatives included Public Health, the Building Official/Floodplain Administrator, as well as members of County Administration and the Board of County Commissioners.

Following introductions Jeff discussed the agenda items; the key discussion is summarized below, and additional details are within the meeting PowerPoint presentation.

Hazard Mitigation Overview

Mark (DHSEM) presented PowerPoint slides that outlined what hazard mitigation is and why mitigation it is important. Mark explained hazard mitigation should be an ongoing effort integrated into both day-to-day operations and long-term planning. Mark noted that FEMA is only concerned with natural hazards being profiled within these plans but explained this does not preclude communities from including manmade hazards, which could help in having a one stop plan for all types of hazards that pose a risk to the community. Mark continued by explaining a hazard mitigation plan is not a regulatory document and is not a set-in-stone commitment of resources. The overall purpose of a local hazard mitigation plan is to prevent knowable hazards from having an impact on the community.

Mark stated there are two main types of benefits a community gains from having a FEMA approved hazard mitigation plan (HMP); (1) bringing people together in the community; (2) having an HMP approved by FEMA makes a community eligible for FEMA grants (Pre-Disaster Mitigation, Flood Mitigation Assistance, Hazard Mitigation Grant Program-Post-Disaster). He noted that any funding requests from FEMA needs to be based on the hazards and mitigation strategy in the HMP. He added that

information from the hazard mitigation plan, specifically the vulnerability assessment and mitigation strategy, can be used in other hazard related plans such as community wildfire protection plans.

FEMA will only fund mitigation projects that will reduce future demand for and the costs of disaster response and recovery such as retrofitting a critical facility, enforcing building codes, land use planning, or removing a structure from a hazard area. Mitigation funding cannot be used for response actions such as purchasing of vehicles for fire or police departments. Mark continued by briefly reviewing the benefit cost relationship of mitigation projects. He shared statistics from the 2017 National Institute of Building Science Report which showed that mitigation grants funded through select federal government agencies, on average, can save the nation \$6 in future disaster costs for every \$1 spent on hazard mitigation. Since 2011, Colorado has had 116 projects awarded FEMA funding for mitigation projects. Mark continued by sharing examples of Western Slope communities that have successfully used mitigation grant funding through FEMA's Hazard Mitigation Assistance Program to complete projects that have mitigated their risks from existing hazards.

Mark continued his presentation by going over some of the planning requirements for the plan. Specifically highlighting the requirement for a participating jurisdiction to be part of an approved plan. Currently, the Town of Lake City is the only local government jurisdiction seeking to participate in the planning process in addition to the County. In order for Lake City to be considered a "participating" jurisdiction they cannot simply adopt the plan but have to also assess their unique risks and identify specific mitigation actions for their community. Mark finished his presentation with asking the HMPC if they have any questions. No HMPC members had questions.

Hazard Mitigation Planning Process and Requirements

Jeff continued the meeting with the specific planning requirements the County will have to meet in order to have a FEMA approved plan. Jeff reviewed the Disaster Mitigation Act (DMA) of 2000 Requirements and explained that the Hinsdale County Multi-Jurisdictional Hazard Mitigation Plan (HMP) will be updated in accordance with these requirements. The planning process involves a 4 Phase approach with 9 tasks per FEMA guidance updated in 2013. The kickoff meeting is the first step in the process and also covers tasks 1-3 (Determine the planning area and resources; Build the planning team; Create an outreach strategy).

Role of the Hazard Mitigation Planning Committee (HMPC)

The first step in getting organized is to determine the hazard mitigation planning committee members, which has already started with those in attendance at the kickoff meeting. Jeff gave those present additional recommendations of who could also be invited to be on the committee, starting with those who were on the committee for the 2014 plan. Jeff first asked the group if there was anyone present that participated in the last plan; Public Health, Wildland Fire and members of the Sheriff's Department were present and participated in the previous plan. While the slide was up with the list of recommended county departments the HMPC informed Jeff that some of those listed as county departments (Public Health and Fire) are now special districts. Jeff noted that special districts could also be considered jurisdictions and be eligible for FEMA funding on their own or have the option to participate as a stakeholder. As a stakeholder they do not need to adopt the plan but could not apply directly to FEMA for grant funding.

Jeff emphasized that local input, and participation from the county, municipalities, and special districts is required for full approval from FEMA. Participation includes the following:

- Attend meetings and participate in the planning process
- Provide requested information to update or develop jurisdictional information
- Review drafts and provide comments
- Identify mitigation projects specific to jurisdiction, provide status
- Assist with and participate in the public input process
- Coordinate formal adoption

Stakeholders include other local, state and federal agencies with a stake in hazard mitigation in the County or may include academic institutions and local business and industry. State and federal stakeholder may include the U.S. Forest Service, U.S. Bureau of Reclamation, CO State Forest Service, and CO Avalanche Information Center. The HMPC noted the Gunnison Basin Wildfire Council should also be included as a stakeholder in their process, in addition to the West Region Wildfire Council. Neighboring counties will also be notified about the update and given an opportunity to provide input into the process. Stakeholders have various options and levels of participation including:

- Attend HMPC meetings or stay in loop via email list
- Provide data/information
- Partner on mitigation efforts
- Review draft plan

Plan Update Requirements, Key Elements and Schedule

Aspects of the planning process include:

- Engage the participants to take part in planning process and efforts
- Raise awareness and engage the public
- Update hazards and baseline development data to reflect current conditions
- Update the mitigation strategy
- Document progress and note changes in priorities

An important requirement of the hazard mitigation planning process is involving the public in the process. FEMA requires the HMPC provide two opportunities for public involvement. FEMA does not prescribe how to involve the public, but Wood recommends this take place during the drafting stage and once more prior to plan approval. There are several advantages to involving the public including developing solutions that fit local needs better, strengthening local support for the plan and ensuring a fair process in the development of the plan. Jeff acknowledged that it can be challenging to get the public to attend meetings and shared that Wood has had success with using online surveys to receive good feedback. It is also recommended to “piggyback” public meeting with other related meetings. The HMPC noted that the public is currently interested in learning about hazards due to the recent wildfires, avalanche events and the expected high spring runoff. There has also been outreach to get the public to register with Code Red for phone-based warnings. The HMPC shared that the Health Fair on May 10th as well as future Flood Risk Map meetings in this summer may be good opportunities to share information with the public on the HMP process.

Another requirement of the plan update process is performing a community capability assessment. This is an assessment of the communities existing plans, regulations, fiscal abilities, administrative and technical abilities. Identifying fiscal abilities early on is important because FEMA requires a 25% match of local funds. Early identification will help to understand potential funding sources now that could be used to possibly match the federal funds.

Conducting a risk assessment is a key aspect of a hazard mitigation plan and involves two components; hazard identification (what can happen here) and the vulnerability assessment (what will be affected). The HMP update will be based on existing documents and studies, with the Hinsdale County Hazard Mitigation Plan (2014) providing the baseline for identified hazards and the groundwork for goals, policies and actions for hazard mitigation.

The HMP will be updated over the next six months, with at least two more meetings with the Hazard Mitigation Planning Committee. Wood will be updating the Hazard Identification and Risk Assessment (HIRA) in the next couple of months, with input from the HMPC. Three drafts of the HMP will be created: the first for review by HMPC committee, a second for public review, and a third for state and FEMA review. The first draft for HMPC review is targeted for mid-August 2019, and a public review draft in September will coincide with a review by Colorado DHSEM.

Review of Identified Hazards

Based on hazards from the 2014 County HMP, the list of potential hazards was reviewed. Jeff showed a slide that listed the hazards in the 2014 HMP.

- Flood
- Wildfire
- Severe Winter Storm
- Severe Thunderstorm Activity
- Avalanche
- Landslide
- Power Outages
- Transportation Accidents
- Drought
- Dam or Reservoir Failure
- Pandemic
- Acts of Terrorism
- Hazmat Accidents
- Earthquake

The group thought that the original list of hazards was still valid and did not suggest any modifications. Jeff noted that the significance level of hazards will vary by jurisdiction, and some hazards may not be applicable to all jurisdictions. Jeff noted that every hazard profiled must have at least one mitigation action identified.

Jeff Brislaw asked the group to review the list of hazards and comment on how they could be enhanced or updated with:

- Historic incidents
- Incident logs
- Public perception
- Scientific studies
- Other plans and reports (e.g., flood and drainage studies, CWPPs, Internet databases)
- Recent disasters

Coordinating with Other Agencies\Related Planning Efforts\Recent Studies

A discussion on recent studies of hazards in other documents and reports followed the identified hazards discussion. Opportunities for coordinating and cross-referencing the HMP were discussed. Recent studies and related planning efforts included:

- Community Wildfire Protection Plan, 2010, 2018
- San Juan Ranch 2018 CWPP
- Upper Rio Grande Flood Protection Plan
- Community Plan updated in 2018 (Town of Lake City and Hinsdale County)
- Avalanche Studies
- Updated data on communications infrastructure
- River restoration plans and projects
- Irrigation District projects
- THIRA has been updated
- Lake City Parking Study
- BLM Traffic Study
- GMUG Forest Plan
- Capital Improvement Plan – funds are being sought to update it

During this discussion the HMPC also noted the Rio Grande Action and Coordination Team and the West Region Wildfire Council as two groups where coordination on mitigation efforts should take place during this planning process. At this time the HMPC also shared aspects of the community that have seen substantial changes since the 2014 plan. These changes included:

- Increase and updates in communication infrastructure
- Forest health changes
- Wildfire events West Fork Complex and burn scar s
- Avalanche event (2019)
 - Working with the CO Recovery and Resiliency Office on lessons learned 2-months post-event
- Power line mitigation (specific to wildfire)
- Redundancy in technology
- New Sheriff office and annex to be built in next 2 years
- Doppler Radar – “react projects”
- Increased wildfire capabilities since 2014 due to remoteness
- Dry hydrant installation
- Fuel reduction projects including Slumgullion Pass area
- Lake San Cristobal outlet improvements

Other considerations for the plan update should include:

- Designate a second and third place for helicopter landing (existing one is in the flood plain)
- Existing Medical Center is in a floodplain
- EOC is currently in the Medical Center and may need to be in a different location due to the flood risk.

Initial Information Needs and Next steps

Jeff discussed a slide with initial information needs and next steps. Jeff encouraged the group to send by email information on:

- Recent hazard events (since 2014) – damages, incident logs, damage assessments, etc.
- Growth and development trends
- Recent updated plans and policies

Where available online, Wood will try to obtain the updated plans previously noted. Jeff encouraged the group to send other information that might not be readily accessible online. A question was raised if Wood had an estimate of local in-kind match hours. Jeff said they did not, but that information should be in their grant agreement with DHSEM.

A Google Share Drive will be set up for the project to share large documents. A GIS needs list was provided to the County to assist with data collection, which is already in progress. The County will provide the meeting summary, handouts, presentation and sign in sheet by email so that other HMPC members that could not attend today's meeting could get up to speed. Jeff noted that he will be in touch to followup on some of the previously identified data sources and plans.

Wood will begin work in the Hazard Identification and Risk Assessment update and develop a public survey that can be used online, with a hardcopy version for dissemination at local events.

The next HMPC meeting will be in early June following the update of the Hazard Identification and Risk Assessment section of the plan. The specific date will be shared when available.

Adjourn

The meeting adjourned at 4:00 pm.

Summary prepared by Jeff Brislawn, Wood

Jeff.brislawn@woodplc.com

303-209-3781

1942 Broadway, Suite 314

Boulder, CO 80302

From: Jami Scroggins <administrator@hinsdalecountycolorado.us>
Sent: Friday, April 12, 2019 9:38 AM
To: Brislawn, Jeff P
Cc: carolinemitchell@townoflakecity.co; Sandy Hines; Richard Kimball; Tara Hardy; Justin Casey; 'Rick Hernandez (seasonsofwood@yahoo.com)'; Drew Petersen - CDPS; Kristie Borchers; 'Bill Hagendorf'; Stan Whinnery; Susan Thompson
Subject: email group for HMP

Hi everyone,

I'm sending the email addresses to Jeff Brislawn (Project Manager) for folks who will hopefully be involved moving forward with this Hazard Mitigation Plan for the Town/County based on yesterday's kick-off. I will also need to include Rebecca (from Lake City Community School) at some point, but I will speak with her since she won't know what I'm talking about if I copy her on this email.

Thanks,

Jami Scroggins
Hinsdale County Administrator
P.O. Box 277
Lake City, CO 81235
970-944-2225



**Summary of the Hinsdale County
Multi-Jurisdictional Hazard Mitigation Plan Update
Risk Assessment and Goals Meeting**

**July 12, 2019
9:00 - noon
Coursey Annex Meeting Room
311 Henson St, Lake City, CO**

Introductions and Opening Remarks

Jeff Brislawn of Wood, the consulting firm hired to facilitate the plan development process, began the meeting with welcoming remarks. Thirteen persons were present and documented on a sign in sheet.

Review of Mitigation, Disaster Mitigation Act (DMA) Requirements, and the Planning Process

Following introductions a PowerPoint presentation was presented by Jeff Brislawn. Jeff reviewed the planning process being followed and discussed the project status.

Risk Assessment Presentation and Discussion

Jeff outlined the general risk assessment requirements before beginning a detailed discussion of each hazard. He presented highlights on each hazard included in the updated risk assessment chapter of the plan. Refer to the Hinsdale County HMP Risk Assessment PowerPoint presentation for specific details on each hazard and a handout summarizing hazard significance.

Additional insight and details were learned during the risk assessment conversation among participants. Highlights of the discussion are noted by hazard in the table below. Potential problem statements that might be candidates for new mitigation actions/projects are **bolded**.

Hazard or Topic	Meeting Discussion and Problem Statements
Dam Incident	• Hidden Treasure Dam risk lowered due to blasting to increase the hole already in this historic structure • Lake San Cristobal – question raised why it is not on the list of high and significant hazard dams. There has been some risk from flooding on the outlet in the past and should be noted. • Crooks Falls Diversion was also noted – Wood will check to see if it is on the list of dams
Avalanche	• March 2019 cycle was like nothing previous in recent history, causing massive tree impacts and debris piles in the valleys. • 4 homes were affected in total in Lake City on March 14; 5 persons evacuated • Avalanches have hit an electric substation • The Rose Lime Kiln, a historic structure, was also impacted and damaged by avalanches in March

Hazard or Topic	Meeting Discussion and Problem Statements
	• Clearing of trees and vegetation to reduce wildfire risk under the power lines above the east side of Lake City have increased the potential for avalanches in the area. • There are numerous avalanche runout zones on CR 20 and 30 that have been recently mapped • The Turkey Foot slide put 20' of snow on Hwy 149, to the surprise of the CAIC. • More avalanche awareness and training for County Road and Bridge staff has been implemented and recommended. • The potential for urban avalanches should be noted (e.g. like Crested Butte roof slide incident this past winter) • County can get the 2007 Larson avalanche report to Wood • DHSEM can get recent avalanche mapping data to Wood
Drought	• Impacts from drought were discussed • Water can't be used for road maintenance and dust control purposes when creeks are running low • Lake City had voluntary water restrictions during the 2018 drought • Recreation impacts are significant • Campfire bans can affect visitation to the area; messaging that fires are still allowed in designated campgrounds could help offset this.
Extreme Cold	• Some intoxication/exposure deaths were noted but otherwise minimal impacts
Flood	• A berm on Henson Creek in Lake City should be noted as providing some protection; this berm was enhanced and lengthened during the 2019 spring flood preparations. • Campground populations along Henson Creek should also be noted as potentially vulnerable. • There has been a lot of interest in monitoring, and enhancing monitoring, of snowpack and stream and rain gages due to recent events. • The information on the PowerPoint slide on critical facilities was questioned regarding the count of critical facilities in the 500 year floodplain, and specifics noted. The 3 EMS stations noted are all in one facility. The post office was thought not to be at risk and the sheriff's office and courthouse should be shown at risk. Wood will double check the analysis • The Town of Lake City wells should be noted as at-risk; these have been sandbagged to protect from anticipated spring flooding. The water system at Lake San Cristobal was also noted to be at risk to floods.
Landslide, Debris Flow, Rockfall	• This hazard should be ranked high significance instead of medium • CR 33 has issues with debris flows every 3 years or so, near the backside of Lake San Cristobal. • CR 20 has rockslides that cause problems in a number of spots. • Shelf Road and Silver Coin also have issues; above the Carson townsite was noted. • Rockfall on the Rio Grande Road and CR 20 below Hidden Treasure Dam was noted; also the Deer Lakes/Cathedral area • Hwy 149 between mile markers 62-85
Severe Thunderstorm	• Thundersnow and lighting was witnessed during the 'bomb cyclone' storm that affected Colorado on March 13, 2019.

Hazard or Topic	Meeting Discussion and Problem Statements
	• Hill 71 communications infrastructure has been impacted by lightning • Roundtop communications infrastructure has been impacted by lightning as well as avalanche debris • Cottonwood trees have been affected by wind events causing risk to roads and populations. CDOT is looking at them in Wade's addition. • School yard restrictions have been emplaced during high winds due to the tree risk
Pandemic Disease	• No recent outbreaks, but a trend in parents not vaccinating children could make them more vulnerable. A statistic of 33% of the kids not having vaccinations was noted.
Winter Storm	• Fall and Spring snows (heavy, wet) have the worst impacts to utilities, structures and trees • Biggest consequence is typically avalanches; County Road 30 and 20 have experienced impacts, notably avalanches, this past winter. • Typically only minor property damage to stovepipes and outbuildings • Road access sometimes a struggle to keep clear • CDOT is considering a snow fence on Slumgullion Pass; the area has become more susceptible due to fuel breaks created for wildfire mitigation and beetle killed tree removal.
Wildfire	• The group also noted a wildfire plan done for the Ptarmigan Meadows subdivision by the West Region Wildfire Council; it was not formally adopted as a CWPP. • There were several questions on the critical facilities noted to be at risk; Wood will check why the OHV route and 1501 CR 30 are listed as critical facilities. Some of the communications infrastructure names were questioned (Password Inc, Educational Media Foundation and the AT&T Corp tower). • Hill 71 and Roundtop communications towers should be added to the list; also the Century Link building • The Lake City electric substations should be noted as Tri-State.
Transportation Accidents	• Potential exists for bus accidents (school busses, tour busses), logging truck incidents, fuel truck accidents. • Blockage of HWY 149 to north or south from an accident is of concern
Hazardous Materials	• The group was not aware of any Tier II facilities • Possible concerns were AmeriGas propane and the Century Link building (battery storage) • There are several brownfields projects resulting from mining including Ute Ulay, Gladiator Mine, Golden Fleece and Galconda • A potential study is needed to see if avalanches could disturb mine tailings piles; CDPHE and CO Div. of Reclamation, Mining and Safety were noted as possible partners.
Utility Failure	• Loss of internet has been problematic, as well as cell phone service; it was noted that both go down frequently • Can lead to economic impacts when credit cards can't be used as well as life safety implications • June 21, 2019 incident noted (Internet)
Terrorism	• Cyber threats are increasing • A ransomware attack on the County Clerk's office occurred in July 2016 that resulted in a bitcoin payout • Another cyber incident in December 2018 changed county employee protocols related to sensitive bank information

Hazard or Topic	Meeting Discussion and Problem Statements
Capabilities	• A bioterrorism incident could potentially be overwhelming • Flood preparedness capabilities have been increased with spring 2019 flood preparedness • County has recently prepared and adopted a debris management plan and an evacuation plan • County has building codes • Silver Thread Public Health has a PEO and COOP • Opportunities for enhancement were discussed including: - o Creating a Capital Improvement Plan - o Update of the COOP - o Additional alert and warning planning - o Linking 3 different evacuation plans - o Adopting wildfire codes - o Update of community plan - o Planning commission is looking at avalanche issues
Development Trends	• There are limited private lands in County • Safe redevelopment should be considered, as well as historic preservation considerations • Some development occurring in the WUI. Some property advertised for sale near avalanche runout areas.

Plan Goals Update

The HMPC reviewed the goals and objectives from the previous plan to see if they were still relevant or needed updating, based on a handout that included the state mitigation plan goals and other related plan goals. In general the group thought was they were still valid, but the 3 single word goals could be expanded upon with more context. Jeff will revise per the suggestions and the group will revisit the goals for finalization at the beginning of the next meeting.

Mitigation Action Strategy update needs

Jeff noted that the mitigation action strategy will be revisited moving forward and will be the focus of the next HMPC meeting. Jeff said that the existing mitigation actions from the 2014 plan will need to be reviewed by the HMPC with a status indicated for each action. Jeff provided a worksheet to help facilitate the status reporting prior to the next meeting, which will also be shared by email. Status of actions was requested by July 30th.

There will be an opportunity to develop new mitigation actions for the plan as well. These will be identified at the next meeting. Some initial ideas discussed included:

- Replacement of undersized culverts on county roads
- Develop an avalanche hazard specific annex to the Emergency Operations Plan
- Explore the potential for CDOT to develop an avalanche mitigation program for the County, based on prioritized avalanche paths (e.g. CR 30 and CR 20 (Ute Ulay), Slumgullion Pass, Turkey Foot, Larson Creek etc); possibly look at Pitkin County program as an analog.

Update on Public Involvement Activities/public meeting.

Jeff noted that a draft on-line public survey was ready to be distributed. A public meeting will be scheduled in August with details forthcoming.

Plan Timeline/Next steps

The next and final HMPC planning meeting will be during early August (now scheduled for August 13 at 9am). The purpose of this meeting is to develop mitigation actions for the plan. Once a date has been identified, a calendar update will be sent out to save the date. The meeting materials will also be shared electronically, including the presentation and handouts.

The meeting adjourned at noon.

**HINSDALE COUNTY MULTI-JURISDICTIONAL
MULTI-HAZARD MITIGATION PLAN
2019 UPDATE**

RISK ASSESSMENT and GOALS Meeting

Friday, July 12, 9:00am – Noon

Coursey Annex, 311 N. Henson St., Lake City, CO

- ❖ **Introductions**
- ❖ **Review of the Planning Process**
- ❖ **Review of Identified Hazards**
- ❖ **Vulnerability Assessment Overview by Hazard**
- ❖ **Capabilities Assessment Update**
- ❖ **Updating Goals for the Mitigation Plan**
- ❖ **Mitigation Action Strategy update needs/ideas**
- ❖ **Update on Public Involvement Activities/public meeting planning**
- ❖ **Next Steps**
- ❖ **Questions and Answers/Adjourn**

SIGN-IN SHEET
HINSDALE COUNTY
LOCAL HAZARD MITIGATION PLAN UPDATE PROJECT
HMPC #2 – Risk and Goals Meeting

Friday July 12th, 2019 @ 9:00am- noon
 Coursey Annex Meeting Room 311 Henson St, Lake City, CO

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail
Jami Scroggins	HC Administrator/Interim EM	Hinsdale County	970-787-8069	administrator@hinsdalecounty.colorado.us
JUSTIN CASEY	HINSDALE SHERIFF	SHERIFF	970-944-2291	jcasey@hinsdalecountysheriff.com
Kristie Borchers	HC	Commissioner	970-596-9071	district2@hinsdalecounty.colorado.us
Jodi Ann Bowers	H.C.R.B.	RTB Supervisor	970-944-2400	roads@hinsdalecounty.colorado.us
Drew Petersen	COEM	Field Manager	970-633-0201	drew.petersen@state.co.us
Kristen Hartge	Hinsdale Public Health/EPR	EPR Coordinator	970-944-0321	Kristen@silverthreadphd.org
Sandy Hines	Admin Asst /PIO	Hinsdale County	970-944-2225	office@hinsdalecounty.colorado.us
R.E. Hall	CDOT	TM II	970- ⁵⁹⁶ 944 -0346	robert.E.Hall@state.co.us
GINA CARR	LCAMC/Hinsdale EMS	Medical Director	(303)824-4903	galkes@hotmail.com
Mark Thompson	COEM	Mitigation Planning	(720)630-0720	mark.thompson@state.co.us
Phil Graham	Hinsdale County	Planner/OEM	303-641-8792	em@hinsdalecounty.colorado.us
BRUCE VERHELLEN	TOWN OF LAKE CITY	MAYOR	970 901 2229	buheller@AOL.com
Jeff Brislow	WOOD	Project Mgr	303-704-5506	Jeff.brislow@woodplc.com

Hinsdale County – 2014 Mitigation Actions Status Worksheet – Return with 2019 Status input by July 30, 2019

Mitigation Action		Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments*
1	Update the county and municipal Land Use & Building Codes and Development Regulations to Mitigate natural hazards	1.1, 1.3, 1.4, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Flood, Wildfire, Severe Winter storm, Severe Thunderstorm Activity, Avalanche, Landslide, Drought, Dam/Reservoir Failure, Earthquake	High	Hinsdale County/ Lake City Government	Ongoing	
2	Adopt/Update the International Building Code (IBC).	1.4, 2.1, 2.2, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Flood, Wildfire, Severe Winter storm, Severe Thunderstorm Activity, Avalanche, Landslide, Drought, Dam/Reservoir Failure, Earthquake	Moderate	Hinsdale County Government	Ongoing	
3	Based on a wildfire vulnerability assessment. Coordinate private lands hazardous fuels reduction projects identified in Hinsdale County CWPP.	1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Wildfire	High	Hinsdale County, Colorado State Forestry	Ongoing	

Hinsdale County – 2014 Mitigation Actions Status Worksheet – Return with 2019 Status input by July 30, 2019

Mitigation Action		Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments*
4	Initiate fire mitigation projects on federal lands identified in the CWPP planning process after appropriate review processes are completed.	1.1, 1.4, 1.5, 2.1, 2.2, 2.3, 3.2, 3.4, 3.5	Wildfire, Flood	Moderate	Hinsdale County, Colorado State Forestry, USDA Forest Service, BLM	Ongoing	
5	Utilize Emergency Management and Fire District Management to educate local governments, builders, architects and other stakeholders about Firewise construction techniques, materials, and private contractors who are able to complete Firewise prevention projects on homeowners' properties.	1.1, 1.2, 1.5, 2.1, 2.5, 3.2, 3.3, 3.5	Wildfire	High	Hinsdale County, Lake City Fire District	Ongoing	
6	Continue participation in the National Flood Insurance program by continuing to enforce floodplain development, incentive-based measures, including regulating new construction in Special Flood Hazard Areas, and by continuing to encourage property owners to purchase flood insurance.	1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.5, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Flood, Dam/ Reservoir Failure	Moderate	Hinsdale County Government	Ongoing	
7	Work with Flood Plain Manager to identify and pursue actions that improve the Community Rating System (CRS) rating.	1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.5, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Flood, Dam/ Reservoir Failure	High	Hinsdale County Government	Ongoing	

Hinsdale County – 2014 Mitigation Actions Status Worksheet – Return with 2019 Status input by July 30, 2019

	Mitigation Action	Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments*
8	Developing a dam failure study and emergency action plan. (Complete Flash Flood Protocol and Procedure Plan)	1.1, 1.2, 1.3, 1.5, 2.1, 2.3, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Flood, Dam/Reservoir Failure	High	Hinsdale County/ Lake City Government	Ongoing	
9	Evaluate current hazard mitigation education/outreach efforts and develop an outreach strategy for planning area. Educate property owners regarding options for mitigating their properties from Identified Hazards.	1.1, 1.2, 2.1, 2.3, 2.5, 3.2, 3.3, 3.4, 3.5	Flood, Wildfire, Severe Winter storm, Severe Thunderstorm Activity, Avalanche, Landslide, Drought, Dam/Reservoir Failure, Earthquake	High	Hinsdale County/ Lake City Government, Lake City Fire District, Lake City School District	Ongoing	
10	Procure, upgrade and maintain backup power generators in all critical facilities identified in the Mitigation Plan.	1.1,1.3, 2.1, 2.2, 2.3, 2.4, 3.1, 3.3, 3.5	Power/ Technology Failures	High	Hinsdale County/ Lake City Government	Ongoing	
11	Reduce damage in sloping areas, such as stabilization, energy dissipation, and flow control measures. Install catch-fall nets for rocks at steep slopes near roadways.	1.1, 1.3, 1.4, 1.5, 2.1, 2.2, 3.1, 3.3, 3.4, 3.5	Landslide, Avalanche	High	Hinsdale County, CDOT	3-5 years, +\$50,000	
12	Assure that Lightning protection devices are adequate for critical facilities identified in the Mitigation Plan.	1.1, 1.4, 2.2, 2.3, 2.4, 3.4, 3.5	Severe Thunderstorm Activity	High	Hinsdale County/ Lake City Government	1 year, \$10,000	

Hinsdale County – 2014 Mitigation Actions Status Worksheet – Return with 2019 Status input by July 30, 2019

Mitigation Action		Goals & Objectives Addressed	Hazard	Priority	Responsible Entities	Timeline/Cost Estimate	2019 Status and Comments*
13	Adopt ArcGIS capabilities within the planning area to develop a comprehensive mapping program for emergency services and Identified Hazards.	1.1, 1.2, 1.3, 1.5, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	All Hazards	Moderate	Hinsdale County/ Lake City Government	2-3 Years, \$30,000-\$50,000	
14	Offering GIS hazard mapping data online for emergency services, residents and design professionals.	1.1, 1.2, 1.3, 1.5, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	All Hazards	High	Hinsdale County/ Lake City Government	3-5 years, \$10,000	
15	Update the county and municipal Comprehensive Plans to address natural hazards.	1.1, 1.4, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.3, 3.5, 3.6, 3.7	All Hazards	Moderate	Hinsdale County/ Lake City Government	Ongoing	
16	Incorporate Code-Red Emergency Communications throughout the County	1.1, 1.2, 2.3, 2.4, 3.5	All Hazards	High	Hinsdale County Government		
17	Improve reliability and coverage of communications systems	1.1, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 3.5	All Hazards	High	Hinsdale County Government	Ongoing	
18	Continue to develop responsible water conservation programs for residential and business consumers and to prioritize water use for emergency situations.	1.1, 1.2, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Drought, Wildfire	High	Town of Lake City Government / Lake Fork Valley Conservancy	Ongoing, 1-5 Years, \$2.5 Million Infrastructure Upgrade	

* Note if Completed (and completion date), Continuing – Not started, Continuing – Partial Implementation, or Delete

HINSDALE COUNTY HAZARD MITIGATION PLAN

2019 UPDATE

Updating the Mitigation Strategy

Mitigation Planning Goals, Objectives, and Actions - Definitions

Goals, objectives, and mitigation actions should be based on the information revealed in the Risk Assessment. Definitions are provided below:

Goals are general guidelines that explain what you want to achieve. Goals are defined before considering how to accomplish them so that the goals are not dependent on the means of achievement. They are usually broad policy-type statements, long term, and represent global visions, such as:

- Reduce exposure to hazard related losses
- Minimize the risk from natural disasters to existing facilities and proposed development.
- Reduce the impact of natural hazards to the citizens of the county.
- Provide protection for natural resources from hazard impacts
- Maintain and enhance existing mitigation measures.
- Increase public awareness of vulnerability to hazards and support and demand for hazard mitigation

Objectives define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific and measurable, such as:

- Maintain the flood mitigation programs to provide 100-year flood protection
- Protect critical facilities to the 500 year flood
- Educate citizens about wildfire defensible space actions.
- Prepare plans and identify resources to facilitate reestablishing operations after a disaster.

Mitigation Actions are specific actions that help you achieve your goals and objectives. Some examples include:

- Elevate three historic structures located in the downtown district
- Sponsor a community fair to promote wildfire defensible space
- Retrofit the police department to withstand flood damage

The goals and objectives from the Hinsdale County Hazard Mitigation Plan 2014 are shown on the next page. The 2019 plan update presents an opportunity to review the goals and modify if desired. Use this handout to verify that they are still appropriate or suggest modifications to the planning committee and Wood (Jeff.brislawn@woodplc.com).

Hinsdale County Hazard Mitigation Plan 2014 Goals

Goal 1: Identify

- 1.1: Identify, introduce and implement cost effective Hazard Mitigation to accomplish the Planning Areas Goals and Objectives.
- 1.2: Identify Outreach Activities to raise the general populations awareness and acceptance of Hazard Mitigation.
- 1.3: Identify Risks that may become or already is a hazard to Hinsdale County.
- 1.4: Identify ways to merge multiple entity plans within the planning area.
- 1.5: Identify leverage building opportunities

Goal 2: Improve

- 2.1: Improve mitigation strategies that will look to protect the general population of Hinsdale County from the identified hazards.
- 2.2: The plan will also seek to improve the County's existing mitigation capabilities.
- 2.3: Improve Emergency Preparedness.
- 2.4: Improve the County's Disaster Response and Recovery Capability.
- 2.5: Improve outreach activities with Residential Areas

Goal 3: Reduce

- 3.1: Reduce the potential impact of natural and Human-Caused disasters on the populations, County's Critical Support Services.
- 3.2: Reduce the potential impact of natural and Human-Caused disasters on private property.
- 3.3: Reduce the potential impact of natural and Human-Caused disasters on the County's economy.
- 3.4: Reduce the potential impact of natural and Human-Caused disasters on the County's natural environment.
- 3.5: Reduce the County's liability with respect to natural and man-made hazards generally.
- 3.6: Reduce the potential impact of natural and Human-Caused disasters on the County's specific historic treasures and interests as well as other tangible and intangible characteristics which add to the quality of life of the citizens and guests of the County
- 3.7: Reduce the potential impact of natural and Human-Caused disasters on Critical Facilities in the County. To reduce the potential impact of natural and man-made disasters on the County's infrastructure.

Other Related Plan Goals

It is also important to integrate the mitigation strategy with other existing goals to ensure consistency, efficiency, and effectiveness, which is also useful in identifying funding opportunities. The following are provided for reference purposes.

Lake City and Hinsdale County Community Plan (2006, amended 2018)

Chapter 7 ENVIRONMENTAL PROTECTION

The idea of preserving and improving the natural environment in and around Lake City and Hinsdale County is an area of widespread consensus. The quality of the environment is the very foundation of the local economy. Issues related to environmental protection are community priorities. Actions and regulations are needed to address a wide range of environmental issues, including flood and geologic hazards, wildlife and habitat protection, air quality, noise and water pollution, and scenic quality. High quality scenic vistas and river corridors, and environmentally unique lands are integral parts of overall environmental quality and to the way of life for permanent and seasonal residents, and visitors.

Goal: Protect and enhance the natural environment to ensure preservation of community character and economic stability.

Objective 7.1 Consider environmental suitability and physical limitations of development sites in making land use decisions.

Action 7.1.1 Identify and map natural hazards areas.

Action 7.1.2 Require professional analysis as part of development review to evaluate any identified natural hazards and determine the degree to which such proposals will:

- A. Subject persons, including the occupants or users of the proposal, to any undue natural hazards;
- B. Create or increase the effect of natural hazard areas on other improvements, activities, or lands; and
- C. Impact the natural environment and be unduly destructive to the natural resources of an area.

Action 7.1.3 Consider environmentally sensitive lands (critical wildlife habitats, floodplains, geologic hazard areas) based on Colorado enabling legislation, H.B. 1041, Areas of State and Local Interest.

Action 7.1.4 Allow development only in areas with safe and adequate septic and water facilities.

Action 7.1.5 Minimize the negative impacts of storm water run-off.

Chapter 15 LAND USE AND DEVELOPMENT

Goal: Promote orderly land use and development in harmony with the existing community and the natural environment.

Objective 15.1 Adopt reasonable land use regulations to preserve private property rights while protecting community interests.

Action 15.1.7 Encourage new development to locate outside of wildfire hazard, geohazard and flood prone areas, or to include appropriate hazard mitigation.

Objective 15.7 Ensure safe housing for all residents.

Action 15.7.4 Enforce zoning, subdivision regulations, construction design standards, historic district guidelines, floodplain regulations, geohazard standards, and building codes, as well as the intent and policies of this Plan, as part of development or redevelopment review.

STATE OF COLORADO 2018 MITIGATION GOALS

Minimize the loss of life and personal injuries from all-hazard events (I)
A, D, F, G, H
Reduce losses and damages to state, tribal, and local governments, as well as special districts and private assets, and support similar local efforts (II)
J, O
Reduce federal, state, tribal, local, and private costs of disaster response and recovery (III)
D, E, J, P, Q
Support mitigation initiatives and policies that promote disaster resiliency, nature-based solutions, cultural resources and historic preservation, and climate adaptation strategies (IV)
A, B, E, M, N
Minimize interruption of essential services and activities (V)
D, E, J, L, P, Q
Incorporate equity considerations into all mitigation strategies (VI)
A, E
Support improved coordination of risk mitigation between and among the public, private, and non-profit sectors (VII)
A, C, D, E, G, I, K, L, M, N, O, R
Create awareness and demand for mitigation as a standard of practice (VIII)

A, B, C, E, G, K, L, M, N, O

Mitigation Objectives:

- A. Support and empower local and regional mitigation strategies through statewide guiding principles, programs, and resources
- B. Promote activities that are climate neutral and supportive of appropriate renewable and alternative energy
- C. Strengthen hazard risk communication tools and procedures
- D. Strengthen continuity of operations at the federal, state, regional, tribal, and local levels of government to ensure the delivery of essential services
- E. Strengthen cross-sector connections across the state government
- F. Identify specific areas at risk to natural hazards and zones of vulnerability
- G. Expand public awareness, education, and information programs relating to hazards and mitigation methods and techniques
- H. Develop mitigation projects focused on preventing loss of life, injuries, and negative impacts to natural resources and reliant community sectors from natural, technological, and human-caused hazards
- I. Assist local government officials with construction, non-construction, and regulatory hazard mitigation activities
- J. Protect state critical, essential, and necessary assets located in natural hazard risk areas
- K. Improve state, tribal, and local government mitigation project monitoring and decision-making tools
- L. Strengthen connections between hazard mitigation activities and preparedness, response, and recovery activities
- M. Improve coordination of state government mitigation resources with federal, tribal, and local government and private nonprofit resources
- N. Increase state, tribal, and local government and private nonprofit participation in existing hazard mitigation programs
- O. Partner with local and tribal governments to develop projects, initiatives, and public resources that protect private property from hazards
- P. Reduce services interruptions and revenue losses, resulting from hazard events, to the state
- Q. Reduce downtime and revenue losses, resulting from hazard events, for local and tribal governments and private nonprofit organizations
- R. Through training, grants, and technical assistance, increase local government use of land use strategies that reduce risks to hazards

From: Karen Berry <kaberry@mines.edu>
Sent: Tuesday, April 23, 2019 1:45 PM
To: BlancoCastano, Marta
Cc: Brislawn, Jeff P
Subject: Re: Landslide GIS data for Hinsdale County HMP Update

You are welcome to use the data as long as you acknowledge CGS as the source. Given recent events in Hinsdale County, there may be some updates in the near future but nothing right now.

Regards,

Karen Berry, PG, AICP
State Geologist and Director
Colorado Geological Survey at the Colorado School of Mines
1801 19th Street
Golden, CO 80401
303.384.2640



From: "BlancoCastano, Marta" <marta.blancocastano@woodplc.com>
Date: Tuesday, April 23, 2019 at 1:09 PM
To: Karen Berry <kaberry@mines.edu>
Cc: "Brislawn, Jeff P" <jeff.brislawn@woodplc.com>
Subject: Landslide GIS data for Hinsdale County HMP Update

Hello Ms. Berry,

My name is Marta Blanco Castano and I am the GIS Analyst who will be conducting various risk assessment portions for the Hinsdale County Hazard Mitigation Plan (HMP) update, under Wood Plc (consulting company). My company also helped put together the Colorado Enhanced Multi-Hazard Mitigation Plan update just this last year, and we used CGS landslide inventory data in spatial form to characterize the landslide and debris flow hazards. See the type of data we used in the map attachment.

For this Hinsdale County HMP Update we were wondering if we had permission to use the same datasets for the landslide and debris flow hazard analyses.

In addition, would you guys at the CGS currently have access to any newer or more accurate landslide/debris flows data for the Hinsdale County region, such as near the Slumgullion Pass area? If so, would we be able to obtain said data in GIS format?

Do let us know if there are any questions related to this request or our ongoing project. Jeff Brislawn is the project manager for this effort and he is being CC'ed in this email.

Thank you,

Marta Blanco Castano

GIS Analyst / Planner

Direct: +1 (303) 630-0768

2000 S. Colorado Blvd, Suite 2-1000

Denver, CO 80222

www.woodplc.com



This message is the property of John Wood Group PLC and/or its subsidiaries and/or affiliates and is intended only for the named recipient(s). Its contents (including any attachments) may be confidential, legally privileged or otherwise protected from disclosure by law. Unauthorized use, copying, distribution or disclosure of any of it may be unlawful and is strictly prohibited. We assume no responsibility to persons other than the intended named recipient(s) and do not accept liability for any errors or omissions which are a result of email transmission. If you have received this message in error, please notify us immediately by reply email to the sender and confirm that the original message and any attachments and copies have been destroyed and deleted from your system.

If you do not wish to receive future unsolicited commercial electronic messages from us, please forward this email to: unsubscribe@woodplc.com and include "Unsubscribe" in the subject line. If applicable, you will continue to receive invoices, project communications and similar factual, non-commercial electronic communications.

Please click <http://www.woodplc.com/email-disclaimer> for notices and company information in relation to emails originating in the UK, Italy or France.

As a recipient of an email from a John Wood Group Plc company, your contact information will be on our systems and we may hold other personal data about you such as identification information, CVs, financial information and information contained in correspondence. For more information on our privacy practices and your data protection rights, please see our privacy notice at <https://www.woodplc.com/policies/privacy-notice>

From: McCormick - DNR, Bill <bill.mccormick@state.co.us>
Sent: Thursday, May 16, 2019 1:19 PM
To: BlancoCastano, Marta
Cc: Brislawn, Jeff P
Subject: Re: Dam Inundation Maps for Dams of Concern in Hinsdale County CO

Hi Marta,

Here is a link to the folder with PDF of the inundation mapping and the EAP's in case you need them. https://drive.google.com/open?id=1HAMa85_DDYYCMuqOzcpbgYD0No_el-zq

You did not state it specifically, but I am assuming you are working on County Hazard Mitigation Plan updates for Hinsdale County? If that is the case you might also find our High Hazard Dam Release Database informative.

Here is a link to that database and tools. <https://drive.google.com/open?id=0B3SCa5V8oMAcdmdyZnRHT2hveW8>

Jeff knows a bit about those tools. Please also read the README file in that folder.

Our Dam Safety Engineers for Hinsdale County are:

Jason Ward

Northern, Water Division 4, WD 62

jason.ward@state.co.us

Matt Gavin

Southern, Water Division 3, WD 20

matthew.gavin@state.co.us

Please feel free to contact those engineers if you need to know anything more specific about the dam in the Hindsdale County.

Let me know if you need anything else.

Best Regards,

Bill

On Thu, May 16, 2019 at 11:33 AM BlancoCastano, Marta <marta.blancocastano@woodplc.com> wrote:

Hi Bill and Kallie,

Just wanted to follow up on this request, and see if you needed anything else from us. We are essentially looking for the existing dam inundation maps for dams of concern in/near Hinsdale County, which are noted in the previous email below.

Thank you,

Marta Blanco Castano

GIS Analyst / Planner
Direct: +1 (303) 630-0768

2000 S. Colorado Blvd, Suite 2-1000

Denver, CO 80222

www.woodplc.com

wood.

From: BlancoCastano, Marta
Sent: Thursday, May 09, 2019 9:04 AM
To: bill.mccormick@state.co.us
Cc: kallie.bauer@state.co.us; Brislawn, Jeff P <jeff.brislawn@woodplc.com>
Subject: Dam Inundation Maps for Dams of Concern in Hinsdale County CO

Hello,

My name is Marta Blanco Castano and I am a GIS analyst for Wood, the consulting firm currently assisting Hinsdale County with updating their Hazard Mitigation Plan. As part of the risk assessment process we would like to use the dam inundation maps for dams of concern which could affect the county, to estimate potential damages or losses across the county with respect to dam failure hazards. Would your office have the dam inundation maps for the following identified significant and high hazard dams?

- Mill Creek Dam No. 1
- Mill Creek Dam No. 2
- Rito Hondo Dam
- Road Canyon #1 Dam
- Troutvale #1 (Upper Browns Lake Dam)
- Troutvale # 2 (Lower Browns Lake Dam)

- Continental Dam
- Rio Grande Dam
- Santa Maria Dam
- Williams Creek Dam

Thank you,

Marta Blanco Castano

GIS Analyst / Planner
Direct: +1 (303) 630-0768

2000 S. Colorado Blvd, Suite 2-1000

Denver, CO 80222

www.woodplc.com



This message is the property of John Wood Group PLC and/or its subsidiaries and/or affiliates and is intended only for the named recipient(s). Its contents (including any attachments) may be confidential, legally privileged or otherwise protected from disclosure by law. Unauthorized use, copying, distribution or disclosure of any of it may be unlawful and is strictly prohibited. We assume no responsibility to persons other than the intended named recipient(s) and do not accept liability for any errors or omissions which are a result of email transmission. If you have received this message in error, please notify us immediately by reply email to the sender and confirm that the original message and any attachments and copies have been destroyed and deleted from your system.

If you do not wish to receive future unsolicited commercial electronic messages from us, please forward this email to: unsubscribe@woodplc.com and include "Unsubscribe" in the subject line. If applicable, you will continue to receive invoices, project communications and similar factual, non-commercial electronic communications.

Please click <http://www.woodplc.com/email-disclaimer> for notices and company information in relation to emails originating in the UK, Italy or France.

As a recipient of an email from a John Wood Group Plc company, your contact information will be on our systems and we may hold other personal data about you such as identification information, CVs, financial information and information contained in correspondence. For more information on our privacy practices and your data protection rights, please see our privacy notice at <https://www.woodplc.com/policies/privacy-notice>

--

Bill McCormick, P.E., P.G.
Chief, Colorado Dam Safety



P 303.866.3581 Ext 8262 | C 719.338.6124

1313 Sherman Street, Rm 821

Denver, CO 80203

bill.mccormick@state.co.us | www.colorado.gov/water

**HINSDALE COUNTY MULTI-JURISDICTIONAL
HAZARD MITIGATION PLAN
2019 UPDATE**

MITIGATION STRATEGY MEETING

Tuesday, August 13, 9:00am – Noon

Coursey Annex, 311 N. Henson St., Lake City, CO

- ❖ **Introductions**
- ❖ **Review of the Planning Process**
- ❖ **Finalizing Updated Goals**
- ❖ **Review of possible mitigation activities and alternatives**
- ❖ **Discuss criteria for mitigation action selection and prioritization**
- ❖ **Review of progress on existing actions in the plan**
- ❖ **Brainstorming Session: Development of new mitigation actions (group process)**
- ❖ **Prioritize mitigation actions (group process)**
- ❖ **Discuss plan implementation and maintenance**
- ❖ **Discuss next steps**
- ❖ **Questions and Answers/Adjourn**

**SIGN-IN SHEET
HINSDALE COUNTY
LOCAL HAZARD MITIGATION PLAN UPDATE PROJECT
HMPC #3 – Mitigation Strategy**

Tuesday August 13th, 2019 @ 9:00am- noon
Coursey Annex Meeting Room 311 Henson St, Lake City, CO

Name	Jurisdiction/Organization/Citizen	Title	Phone	E-mail
Jeff Brislawn	Wood	Project Manager	303-704-5506	jeff.brislawn@woodplc.com
Phil Graham	Hinsdale County	Planner	303-641-8792	em@hinsdalecountycolorado.com
Jami Scroggins	Hinsdale County	County Administrator	970-944-2225	administrator@hinsdalecountycolorado.us
JUSTIN CASEY	HINSDALE COUNTY	SHERIFF	970-944-2291	jcasey@hinsdalecountysheriff.com
Tara Hardy	Public Health	Director	970-944-0321	tara@silverthreadphd.org
Sandy Hies	Hinsdale County	Admin Asst.	970-944-2225	office@hinsdalecountycolorado.us
Mark Thompson	DHSEM	Mitigation Planning	720-630-0770	mark.thompson@state.co.us
Robert Thibault	Hinsdale County	Building Official - CFM	905-360-6539	building@hinsdalecountycolorado.us
Kristie Borchers	Hinsdale County	Commissioner	970-596-9071	district2@hinsdalecountycolorado.us

Hinsdale County Hazard Mitigation Plan Update 2019

New Mitigation Action Worksheet

Use this to record new potential mitigation projects (1 form per project) identified during the planning process. Provide as much detail as possible and use additional pages as necessary. Complete and return to Jeff Brislawn by **August 30th**. **Note Jurisdiction:**

Mitigation Action/Project Title	
Hazard(s) Mitigated	
Priority (High, Medium, Low)	
Project Description, Issue/Background	
Responsible Office/ Agency and partners	
Timeline for Completion	
Cost Estimate	
Benefits (Avoided Losses)	

Prepared by: _____
 Title/Dept: _____
 Phone: _____
 Email: _____

Please return worksheets by email to:

Jeff Brislawn
 jeff.brislawn@woodplc.com
 Phone: 303-704-5506

Mitigation Action Selection and Prioritization Criteria

Does the proposed action protect lives or vulnerable populations?

Does the proposed action address hazards or areas with the highest risk?

Does the proposed action protect critical facilities, infrastructure, or community assets?

Does the proposed action meet multiple objectives (multi-objective management)?

STAPLE/E

Developed by FEMA, this method of applying evaluation criteria enables the planning team to consider in a systematic way the social, technical, administrative, political, legal, economic, and environmental opportunities and constraints of implementing a particular mitigation action. For each action, the HMPC should ask, and consider the answers to, the following questions:

Social

Does the measure treat people fairly (different groups, different generations)? Does it consider social equity, disadvantaged communities, or vulnerable populations?

Technical

Will it work? (Does it solve the problem? Is it feasible?)

Administrative

Is there capacity to implement and manage project?

Political

Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support it?

Legal

Does your organization have the authority to implement? Is it legal? Are there liability implications?

Economic

Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development? Does it reduce direct property losses or indirect economic losses?

Environmental

Does it comply with environmental regulations or have adverse environmental impacts?

Example Mitigation Actions by FEMA categories with Hazards Identified in the Hinsdale County Hazard Mitigation Plan Update 2019

Alternative Mitigation Actions	Dam Incident	Floods	HazMat	Human Hazards: Pandemic Flu; Transportation Accident; Terrorism	Avalanches; Landslides/ Debris Flows/ Rockfalls	Weather Extremes (drought, hail, lightning, wind and tornado, temps)	Earth quakes	Wildfire	Severe Winter Storm and Utility Failure
PLANS and REGULATIONS									
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 Incident	Floods	HazMat	Human Hazards: Pandemic Flu; Transportation Accident; Terrorism	Avalanches; Landslides/ Debris Flows/ Rockfalls	Weather Extremes (drought, hail, lightning, wind and tornado, temps)	Earth quakes	Wildfire	Severe Winter Storm and Utility Failure
Tree Management						■		■	■
Transfer of development rights		■			■			■	
Utility location			■		■	■			■
STRUCTURE AND INFRASTRUCTRE PROJECTS									
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.)		■	■		■	■	■	■	■
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						■			
Debris Control		■			■				
Defensible Space								■	
Stream stabilization		■			■				
EDUCATION AND AWARENESS									
Flood Insurance	■	■							
Hazard information centers	■	■	■	■	■	■	■	■	■

Alternative Mitigation Actions	Dam Incident	Floods	HazMat	Human Hazards: Pandemic Flu; Transportation Accident; Terrorism	Avalanches; Landslides/ Debris Flows/ Rockfalls	Weather Extremes (drought, hail, lightning, wind and tornado, temps)	Earth quakes	Wildfire	Severe Winter Storm and Utility Failure
Public education and outreach programs	■	■	■	■	■	■	■	■	■
Real estate disclosure	■	■	■		■	■	■	■	■
Crop Insurance						■	■		
Lightning detectors in public areas						■			
NATURAL SYSTEMS PROTECTION									
Best Management Practices (BMPs)		■	■		■	■		■	
Forest and vegetation management	■	■			■	■		■	■
Hydrological Monitoring	■	■	■		■	■			
Sediment and erosion control regulations	■	■	■		■				
Stream corridor restoration		■			■				
Stream dumping regulations		■	■						
Urban forestry and landscape management		■			■	■		■	■
Wetlands development regulations		■	■		■			■	
EMERGENCY SERVICES									
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	■	■	■	■	■			■	

Public Notice Ad

Public Meeting on the Hinsdale County Hazard Mitigation Plan Update

Location:

Monday , August 12, 2019 at 5:00-7:00 pm.

The purpose of the meeting will be to discuss the update of the County's hazard mitigation plan, with an emphasis on hazards such as floods, wildfires, avalanches, and landslides and their potential impacts. The plan details the risk that multiple hazards pose to the County and Lake City and identifies strategies intended to reduce future losses from these hazards. The plan is being updated under the guidance of a multi-jurisdictional Hazard Mitigation Planning Committee (HMPC) with assistance from a consultant and a FEMA grant. Attendees will learn more about the hazards and strategies to mitigate them at this meeting. Public input is also being sought on these same topics at this meeting.

A brief public survey related to the plan can be accessed at:

https://woodplc.surveymonkey.com/r/Hinsdale_Hazard_Mitigation_Plan

For more information contact:

in the country; thank you for helping protect them from light pollution so everyone can enjoy the starry night sky! Check out Mountaineer Theatre's weather webcam - KCOLAKEC7 @ www.weatherunderground.com.

For Sale



Silver Street
k and John
City's central
Business and
ict and can be
city water and
ll Realty at
nformation.

y, Inc.
Since 1973.

on....



ation Paradise"

fishing

door

e rides

et

abin?

!

tion for

ily!



Paul Vickers

Educating and Building Real Estate Relationships Since 1994.

"I have been in the game long enough to know I don't have all the answers"

paulvickersrealty.com

970-275-2382



Public Meeting Hinsdale County Hazard Mitigation Plan Update

Monday, August 12
5 to 7 pm.
Coursey Annex

Learn about the update of the County's hazard mitigation plan, with an emphasis on hazards such as floods, wildfires, avalanches, and landslides and their potential impacts, as well as strategies intended to reduce future losses from these hazards. Your input is welcomed!

Please consider taking a brief survey to provide input on hazards that could impact our town and county.

Visit www.hinsdalecountycolorado.us to complete this important survey. Thank you!



**RV, Camp
Supplies and
Gifts!**

**Highlander RV
Campground**



Doug Stiel and Cindy Bissell Perform August 9 Lake City Arts

Join us for an evening of great fun and laughter with Doug Stiel and Cindy Bissell as they sing some of our favorite songs from some of the most epic performers!

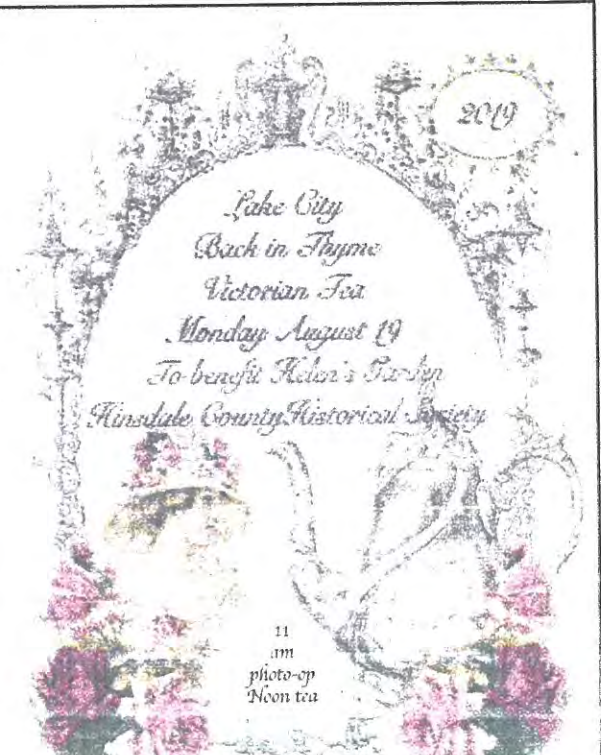
Moseley Arts Center/\$18/\$15
(with membership)

For tickets visit the box office 1 - 4 pm or
visit www.lakecityarts.org

SILVER WORLD CLASSIFIEDS

PROVEN EFFECTIVE

970-944-2515





Public Meeting Agenda

Date: 12 August 2019
5:00 PM – 7:00 PM

Meeting at:

Project: Hinsdale County Hazard Mitigation Plan Update

Subject/Purpose

This meeting is for the public to learn more about the Hinsdale County Hazard Mitigation Plan Update, learn about hazards and vulnerabilities, and provide input into the planning process. The primary intent of the meeting is to gather feedback on mitigation strategies to reduce identified hazard vulnerabilities, answer questions, and gather input to share with the Hazard Mitigation Planning Committee for the plan update. The plan identifies hazards, vulnerabilities, assets at risk, and ways to reduce impacts through long-term, sustainable mitigation projects.

-
1. Introductions
 2. Overview of the Multi-Jurisdictional Hazard Mitigation Plan Update and Planning Process
 3. Online Public Survey Results
 4. Review of Identified Hazards
 5. Discuss Mitigation Action Strategies (current and recommended)
 6. Schedule and Next Steps
 7. Questions and Answers

COMMENT CARD

Hinsdale County Hazard Mitigation Plan Update: Public Meeting – August 12, 2019

Please leave a comment related to the County's Hazard Mitigation Plan. Please provide your contact info if you would like to receive ongoing updates and information related to the Plan by email, phone, or mail.

Name (optional):

Email (optional):

Phone Number (optional):

Mailing Address (optional):

Comment:

Or fill out the brief Online Survey at:

[https://woodplc.surveymonkey.com/r/Hinsdale Hazard Mitigation Plan](https://woodplc.surveymonkey.com/r/Hinsdale_Hazard_Mitigation_Plan)

Comment cards must be delivered to the comment box by the end of the meeting.

From: Brislawn, Jeff P
Sent: Wednesday, July 24, 2019 2:16 PM
To: Sandy Hines
Cc: Phil Graham; Jami Scroggins
Subject: RE: Hinsdale County Hazard Mitigation Plan draft online survey

Sandy,
Good suggestion. We added some more text to explain mitigation and the purpose of the plan on the initial page. Here is some text that can be posted with the finalized link. Please distribute in as many ways possible (post on web, social media, traditional media, email lists, etc.). For documentation purposes please keep track of how it was distributed. A summary email to me will work fine.

Take our Survey!

Hinsdale County is in the process of updating its Hazard Mitigation Plan. The Hazard Mitigation Plan analyzes the County's vulnerabilities to natural and manmade hazards and identifies mitigation actions the County and Lake City can take to minimize property damage and reduce the loss of life prior to a hazard event. The purpose of this brief, five question survey is to collect information from the public and stakeholders to better understand the vulnerabilities within the County and Lake City as well as solicit input on needs to best mitigate, or reduce, the impacts of hazards before they occur. Please complete by August 25, 2019.

https://woodplc.surveymonkey.com/r/Hinsdale_Hazard_Mitigation_Plan

From: Sandy Hines <office@hinsdalecountycolorado.us>
Sent: Tuesday, July 23, 2019 10:37 AM
To: Brislawn, Jeff P <jeff.brislawn@woodplc.com>; Phil Graham <EM@hinsdalecountycolorado.us>; Jami Scroggins <administrator@hinsdalecountycolorado.us>
Subject: RE: Hinsdale County Hazard Mitigation Plan draft online survey

Good morning

I went through the survey and for me it seemed to be working correctly. I would suggest that we use plain language as much as possible. Keep in mind most people don't even understand the term "mitigation" as we use it.

I can get the survey out through our channels quickly at any point. Just let me know when it is ready to go.

Sandy Hines

Hinsdale County
- Administrative Assistant
- Public Information Officer

From: Brislawn, Jeff P <jeff.brislawn@woodplc.com>
Sent: Tuesday, July 23, 2019 10:19 AM
To: Phil Graham <EM@hinsdalecountycolorado.us>; Jami Scroggins <administrator@hinsdalecountycolorado.us>; Sandy Hines <office@hinsdalecountycolorado.us>
Subject: FW: Hinsdale County Hazard Mitigation Plan draft online survey

Meant to include Phil and Sandy on this.....

From: Brislawn, Jeff P
Sent: Tuesday, July 23, 2019 10:17 AM
To: 'Jami Scroggins' <administrator@hinsdalecountycolorado.us>
Subject: RE: Hinsdale County Hazard Mitigation Plan draft online survey

Jami, Sandy and Phil

Could you each test the link at the bottom of this email to see if you can view the public survey questions? If it works I can create a new web link that is more simplified for distribution. When ready we'll want to push the link out through your PIO channels and I also recommend placing it on the county home page. Can we try to get this out by the end of the week, so we can gather feedback until late August?

Regards,
Jeff

From: Jami Scroggins <administrator@hinsdalecountycolorado.us>
Sent: Tuesday, July 09, 2019 2:08 PM
To: Brislawn, Jeff P <jeff.brislawn@woodplc.com>
Subject: RE: Hinsdale County Hazard Mitigation Plan draft online survey

Not the first time, and I just never had time to give it another shot...sorry.

Jami Scroggins
Hinsdale County Administrator
P.O. Box 277
Lake City, CO 81235
970-944-2225



From: Brislawn, Jeff P <jeff.brislawn@woodplc.com>
Sent: Tuesday, July 9, 2019 11:29 AM
To: Jami Scroggins <administrator@hinsdalecountycolorado.us>
Subject: FW: Hinsdale County Hazard Mitigation Plan draft online survey

Were you able to get the survey to work for you?

From: Brislawn, Jeff P
Sent: Thursday, June 20, 2019 3:08 PM
To: Jami Scroggins <administrator@hinsdalecountycolorado.us>
Cc: Carr, Amy <amy.carr@woodplc.com>
Subject: RE: Hinsdale County Hazard Mitigation Plan draft online survey

There should be 5 questions across 6 pages. I checked and the link worked for me. You might try it in a different browser. I've cc'd Amy Carr who can help if you are still having problems. I'm going to be out on leave next week.
Jeff

From: Jami Scroggins <administrator@hinsdalecountycolorado.us>
Sent: Thursday, June 20, 2019 12:24 PM
To: Brislawn, Jeff P <jeff.brislawn@woodplc.com>
Subject: RE: Hinsdale County Hazard Mitigation Plan draft online survey

Jeff,

I tried this survey, but it was only one page is that correct? It seemed to have glitch issues when I hit the "send feedback" button.

Thanks,

Jami Scroggins
Hinsdale County Administrator
P.O. Box 277
Lake City, CO 81235
970-944-2225



From: Brislawn, Jeff P <jeff.brislawn@woodplc.com>
Sent: Wednesday, June 19, 2019 2:09 PM
To: Jami Scroggins <administrator@hinsdalecountycolorado.us>
Subject: FW: Hinsdale County Hazard Mitigation Plan draft online survey

Jami,
Did you get a chance to try this survey out? If you like it I can finalize it and create a simple URL for it and distribute to the planning committee. Let me know if you have other media, social media, email groups we can distribute it through.
Jeff

From: Brislawn, Jeff P
Sent: Tuesday, May 21, 2019 8:45 AM
To: Jami Scroggins <administrator@hinsdalecountycolorado.us>
Subject: Hinsdale County Hazard Mitigation Plan draft online survey

Jami,

This is a test version of Hinsdale County Hazard Mitigation Plan Update Public Input Survey, a survey I designed using SurveyMonkey:

https://www.surveymonkey.com/r/Preview/?sm=P9z7HwJoxq6gYk196bF_2F4mMPJn_2BLTENWY0S56HIW1opPf5PjRcEkUwVTpKs8_2FRTHYeX0_2BVrqzsPJtuHK9O2ClyDO14l4lATojf65QMH4R2g_3D

I've sent you this test version so you can preview the survey.

Let me know if you suggest any changes. When its good to go we can share with the HMPC and through other public information channels to get the word out.

Thanks

Jeff

Jeff Brislawn
Hazard Mitigation Lead/Sr Associate
Hazard Mitigation and Emergency Management Program
Direct: 303-209-3781
Mobile: 303-704-5506
www.woodplc.com



This message is the property of John Wood Group PLC and/or its subsidiaries and/or affiliates and is intended only for the named recipient(s). Its contents (including any attachments) may be confidential, legally privileged or otherwise protected from disclosure by law. Unauthorized use, copying, distribution or disclosure of any of it may be unlawful and is strictly prohibited. We assume no responsibility to persons other than the intended named recipient(s) and do not accept liability for any errors or omissions which are a result of email transmission. If you have received this message in error, please notify us immediately by reply email to the sender and confirm that the original message and any attachments and copies have been destroyed and deleted from your system.

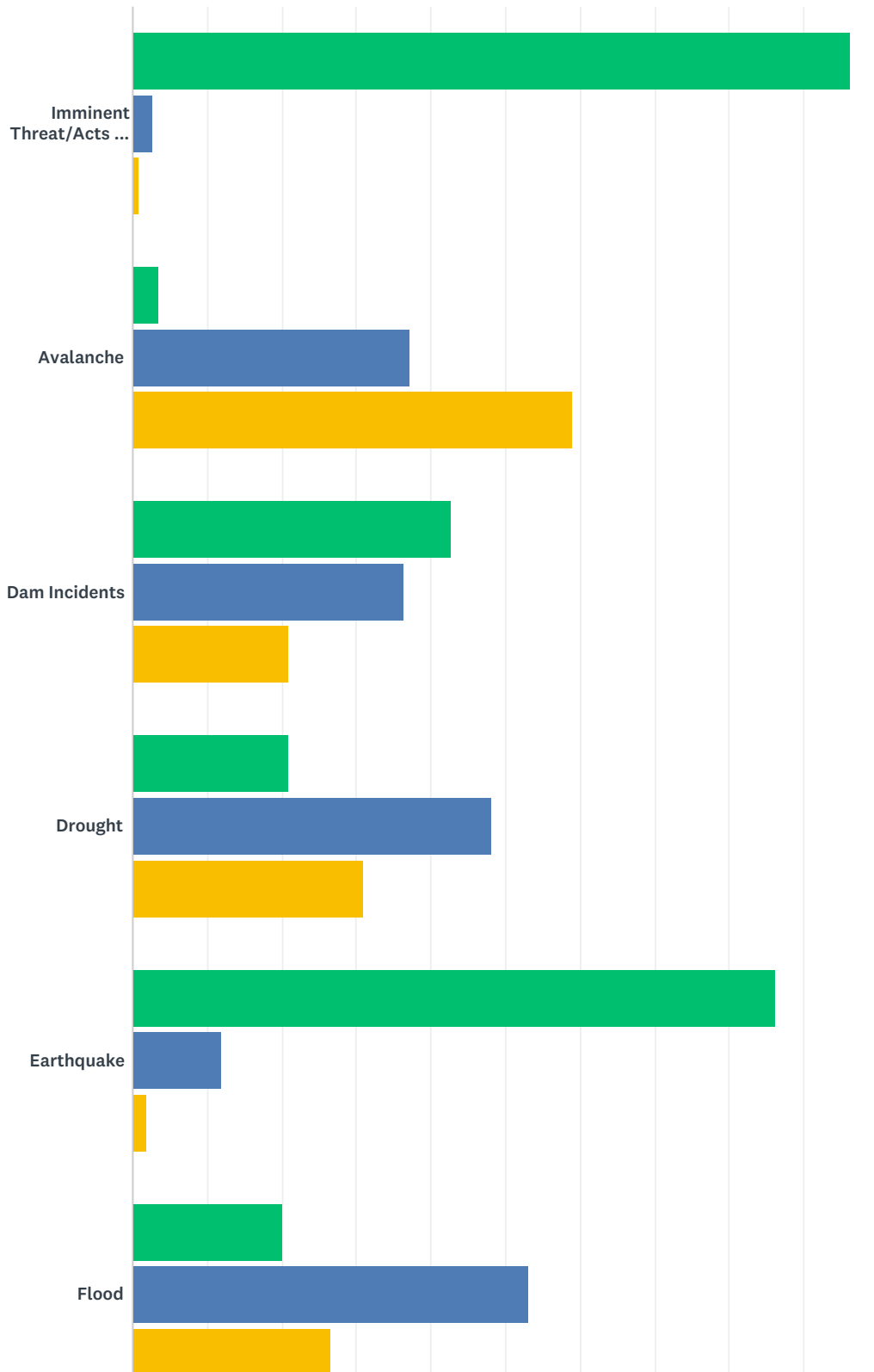
If you do not wish to receive future unsolicited commercial electronic messages from us, please forward this email to: unsubscribe@woodplc.com and include "Unsubscribe" in the subject line. If applicable, you will continue to receive invoices, project communications and similar factual, non-commercial electronic communications.

Please click <http://www.woodplc.com/email-disclaimer> for notices and company information in relation to emails originating in the UK, Italy or France.

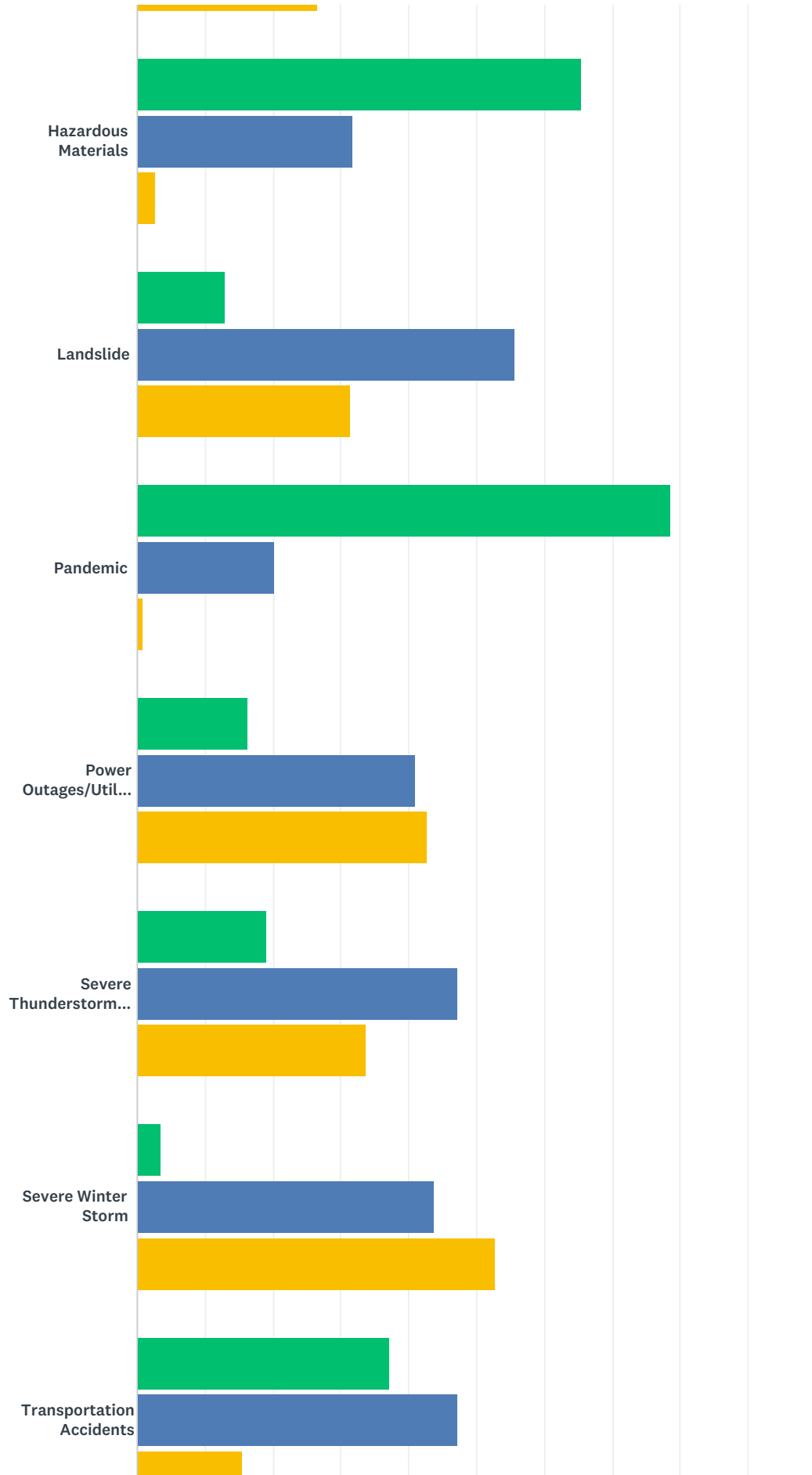
As a recipient of an email from a John Wood Group Plc company, your contact information will be on our systems and we may hold other personal data about you such as identification information, CVs, financial information and information contained in correspondence. For more information on our privacy practices and your data protection rights, please see our privacy notice at <https://www.woodplc.com/policies/privacy-notice>

Q1 The hazards addressed in the Hazard Mitigation Plan update are listed below. Please indicate the level of significance in Hinsdale County that you perceive for each hazard.

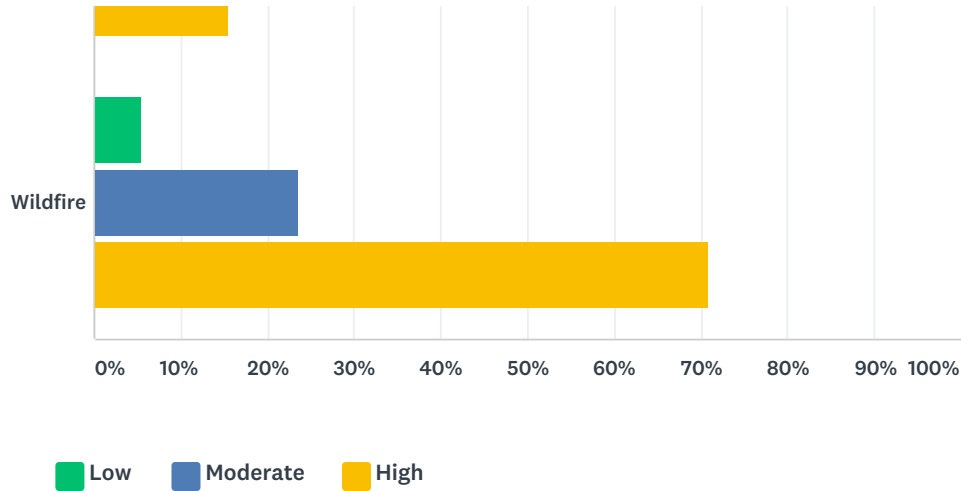
Answered: 110 Skipped: 0



Hinsdale County Hazard Mitigation Plan Update Public Input Survey



Hinsdale County Hazard Mitigation Plan Update Public Input Survey



	LOW	MODERATE	HIGH	TOTAL	WEIGHTED AVERAGE
Imminent Threat/Acts of Terrorism	96.30% 104	2.78% 3	0.93% 1	108	1.05
Avalanche	3.64% 4	37.27% 41	59.09% 65	110	2.55
Dam Incidents	42.73% 47	36.36% 40	20.91% 23	110	1.78
Drought	20.91% 23	48.18% 53	30.91% 34	110	2.10
Earthquake	86.24% 94	11.93% 13	1.83% 2	109	1.16
Flood	20.18% 22	53.21% 58	26.61% 29	109	2.06
Hazardous Materials	65.45% 72	31.82% 35	2.73% 3	110	1.37
Landslide	12.96% 14	55.56% 60	31.48% 34	108	2.19
Pandemic	78.70% 85	20.37% 22	0.93% 1	108	1.22
Power Outages/Utility Failure	16.36% 18	40.91% 45	42.73% 47	110	2.26
Severe Thunderstorm Activity	19.09% 21	47.27% 52	33.64% 37	110	2.15
Severe Winter Storm	3.64% 4	43.64% 48	52.73% 58	110	2.49
Transportation Accidents	37.27% 41	47.27% 52	15.45% 17	110	1.78
Wildfire	5.45% 6	23.64% 26	70.91% 78	110	2.65

#	OTHER (PLEASE SPECIFY)	DATE
1	Hyperinflation (currency collapse)	8/5/2019 1:00 PM
2	Altercations between tourists and residents over trespassing	8/3/2019 11:39 AM
3	Forest service shut down roads that could be used for emergency exit or supply roads. Pennison park road hat side lines 149 to deer lakes road. If maintained it would be a great option.	7/28/2019 3:15 PM

Hinsdale County Hazard Mitigation Plan Update Public Input Survey

4	Public In-fighting by residents is our greatest risk to the county	7/26/2019 12:05 AM
5	CR-30 is a major risk with all of the potholes. The signs on 149 at CR-30 blocks traffic view.	7/25/2019 10:59 AM
6	Lack of internet and cellular communications.	7/25/2019 7:44 AM
7	Network and general communications failures - High	7/25/2019 6:30 AM
8	unenforced traffic--speeding	7/25/2019 6:16 AM
9	Accidents blocking 149	7/25/2019 4:38 AM
10	I believe loss of communications (3G/LTE) need to be included in a crucial part of the Hazard Mitigation and Public Safety concerns.	7/25/2019 4:08 AM

Q2 Do you have information on specific hazard issues/problem areas that you would like the planning committee to consider? Note the jurisdiction to which it applies (County or Lake City):

Answered: 30 Skipped: 80

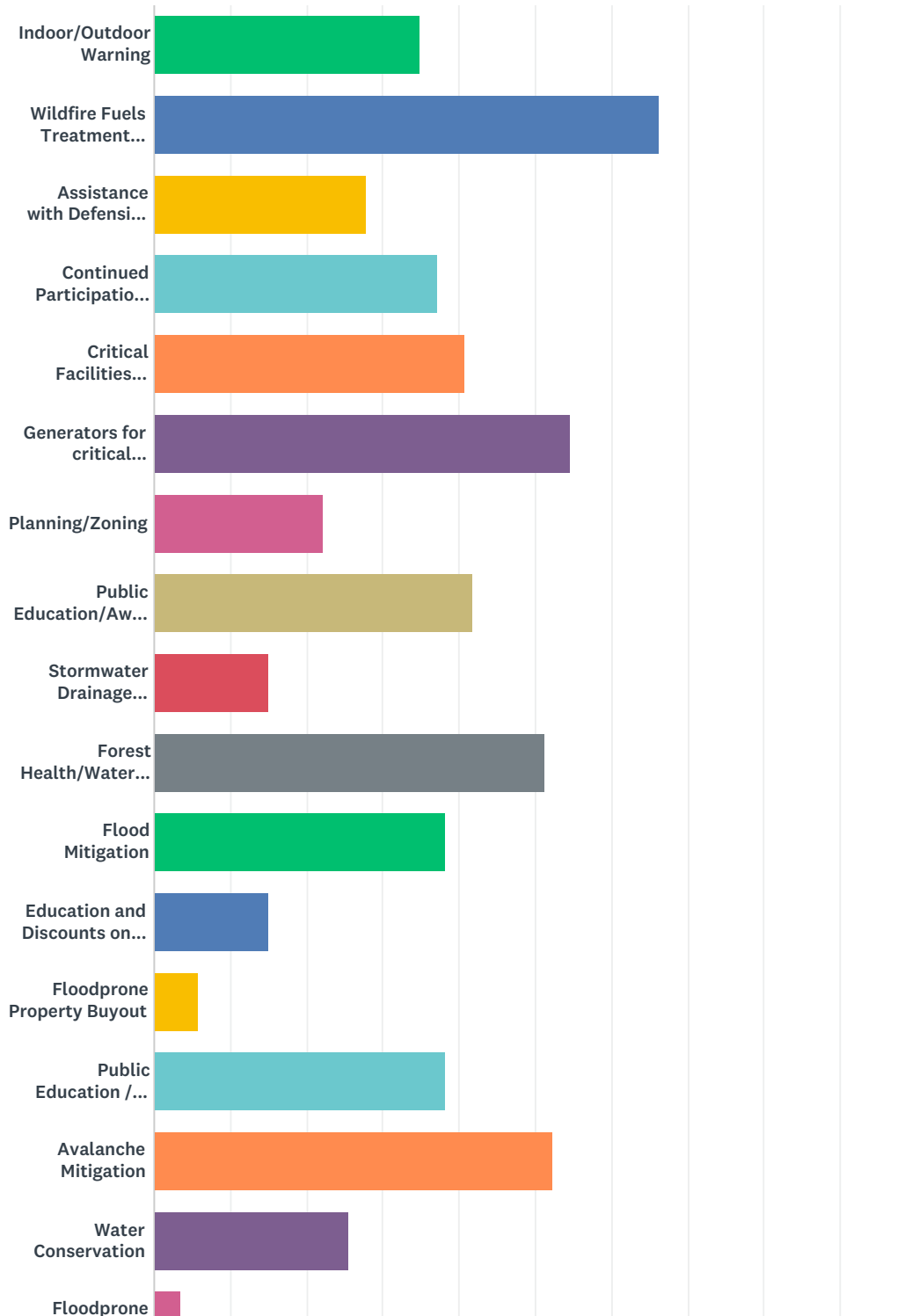
#	RESPONSES	DATE
1	no	8/14/2019 3:47 AM
2	Road conditions both city and county	8/12/2019 3:52 PM
3	Avalanche mitigating in Lake City	8/12/2019 4:55 AM
4	Hyperinflation (currency collapse), Electro Mag. Pulse	8/5/2019 1:01 PM
5	No	8/5/2019 2:26 AM
6	County roads	8/3/2019 1:50 PM
7	the lake road	7/28/2019 3:32 PM
8	Fixing the road up to Lake On county rd. 30	7/28/2019 3:19 PM
9	Floods and wildfires- county	7/26/2019 2:59 PM
10	Strong enforcement of ohv laws	7/25/2019 11:56 PM
11	County	7/25/2019 10:07 PM
12	Avalanches, Hinsdale County	7/25/2019 6:57 PM
13	The extent of dead Engleman Spruce trees with risk of fire	7/25/2019 2:56 PM
14	no	7/25/2019 2:46 PM
15	No special expertise	7/25/2019 1:55 PM
16	CR-30 needs to be resurfaced. Potholes have caused vehicles to swerve into oncoming traffic. Turning off of CR-30 the No OHV sign blocks view of the traffic coming from Slumgullion Pass.	7/25/2019 11:02 AM
17	No	7/25/2019 8:33 AM
18	Lack of reliable cellular communications (especially data) continue to be an issue.	7/25/2019 7:45 AM
19	Lack of coordination/cooperation between agencies within area - basically Fire and Sheriff. Also communications issues - can't talk due to geography and radios, also internet and cell service.	7/25/2019 7:07 AM
20	No	7/25/2019 6:29 AM
21	Not at this time	7/25/2019 6:29 AM
22	I think that the flood danger may be re-current and that the sandbags may need to be kept in place along the river and the birm--they could be painted to be more appealing	7/25/2019 6:18 AM
23	No	7/25/2019 5:38 AM
24	Habituated bears	7/25/2019 5:33 AM
25	No	7/25/2019 5:13 AM
26	Hinsdale County	7/25/2019 4:55 AM
27	Our biggest problem is our county commissioners over reacting on every situation and that goes to the town emergency manager also	7/25/2019 4:41 AM
28	County, accidents on 149 that would prevent us from getting into LC from south, rock slides, mud slides , avalanche, OHV careening off road, other vehicles doing same with high speed on curves.	7/25/2019 4:41 AM
29	Both	7/25/2019 4:10 AM

Hinsdale County Hazard Mitigation Plan Update Public Input Survey

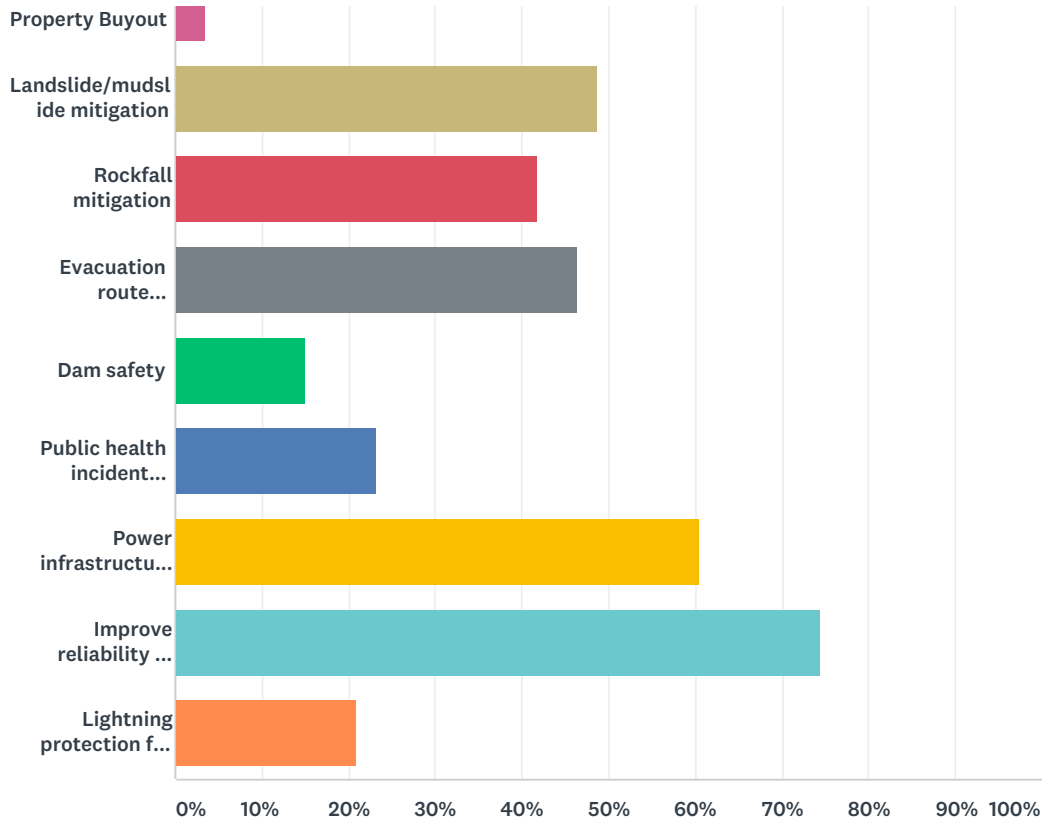
30	As mentioned in "other" section. Communications. We have a real issue here that needs to be addressed.	7/25/2019 4:08 AM
----	--	-------------------

Q3 Mitigation is actions that can be taken to reduce or eliminate the long-term risk to hazards. The following types of mitigation actions may be considered in Hinsdale County. Please indicate the types of mitigation actions that you think should have the highest priority in the Hinsdale County Hazard Mitigation Plan.

Answered: 86 Skipped: 24



Hinsdale County Hazard Mitigation Plan Update Public Input Survey



ANSWER CHOICES	RESPONSES	
Indoor/Outdoor Warning	34.88%	30
Wildfire Fuels Treatment projects	66.28%	57
Assistance with Defensible Space	27.91%	24
Continued Participation in the National Flood Insurance Program	37.21%	32
Critical Facilities Protection	40.70%	35
Generators for critical facilities	54.65%	47
Planning/Zoning	22.09%	19
Public Education/Awareness	41.86%	36
Stormwater Drainage Improvements	15.12%	13
Forest Health/Watershed Protection	51.16%	44
Flood Mitigation	38.37%	33
Education and Discounts on Flood Insurance	15.12%	13
Floodprone Property Buyout	5.81%	5
Public Education / Awareness of hazards	38.37%	33
Avalanche Mitigation	52.33%	45
Water Conservation	25.58%	22
Floodprone Property Buyout	3.49%	3

Hinsdale County Hazard Mitigation Plan Update Public Input Survey

Landslide/mudslide mitigation	48.84%	42
Rockfall mitigation	41.86%	36
Evacuation route development	46.51%	40
Dam safety	15.12%	13
Public health incident preparedness	23.26%	20
Power infrastructure protection	60.47%	52
Improve reliability of communications systems	74.42%	64
Lightning protection for critical facilities	20.93%	18
Total Respondents: 86		

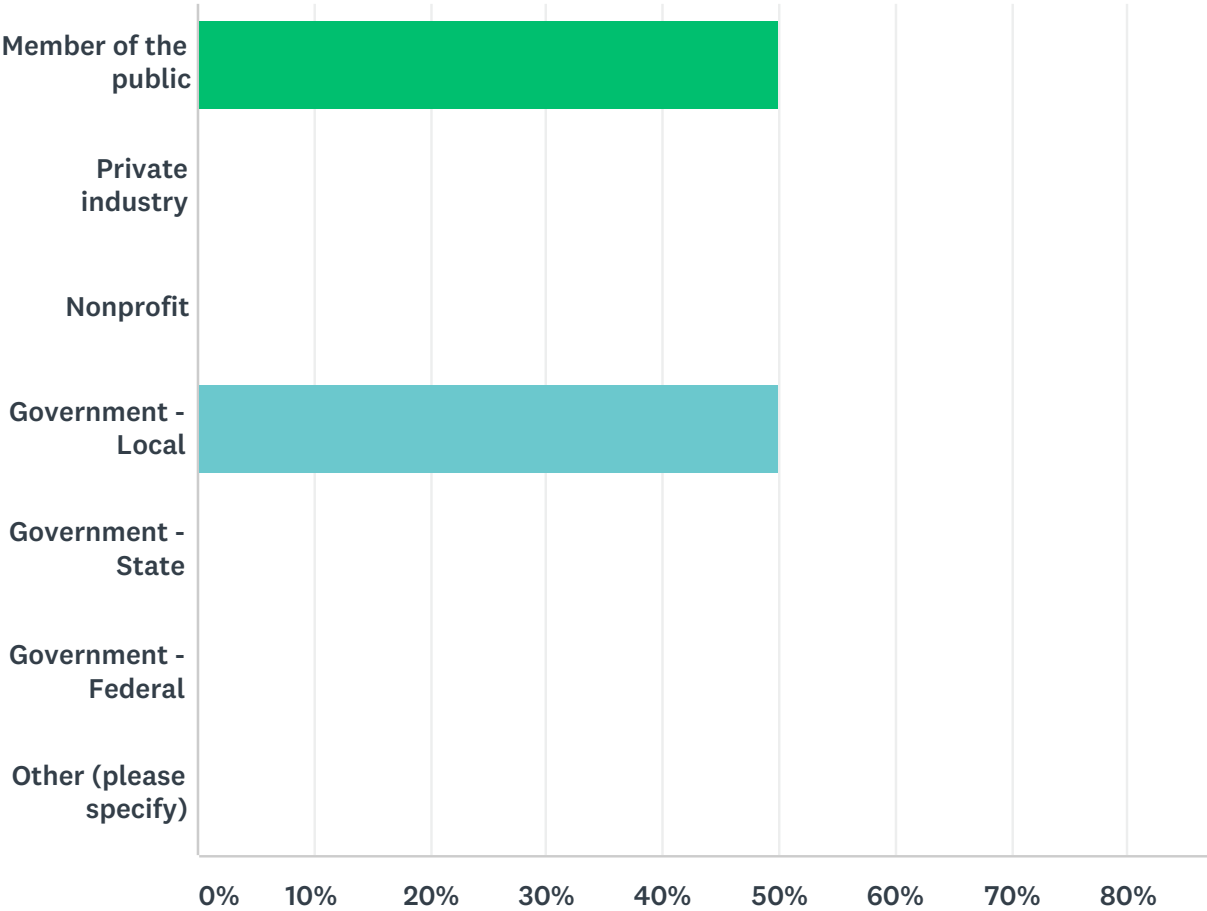
Q4 Please comment on any other pre-disaster strategies that the planning committee should consider for reducing future losses caused by natural disasters:

Answered: 19 Skipped: 91

#	RESPONSES	DATE
1	Because of all the avalanches mitigation of potential mud and rock slides	8/12/2019 3:55 PM
2	redudancy of communication & forest health restoration	8/12/2019 10:31 AM
3	Maintain, improve levees. Clear folage trees.	8/5/2019 1:04 PM
4	Removal of dead trees due to Spruce beetle	8/3/2019 1:53 PM
5	How about leave the hump in the road or building the elevation up in a strategic way on the south side of Henson creek on 149 and the surrounding areas permanent. So that it is not such a overwhelming feat to be prepared the next time.	7/28/2019 3:26 PM
6	Invest in road maintenance and maintain the roads for safe travel in the event of an emergency	7/26/2019 12:01 AM
7	Qualified Chimney Sweeps list and public awareness	7/25/2019 10:12 PM
8	Logging	7/25/2019 6:42 PM
9	County and Town leadership in mitigating the recent flood potential was absolutely outstanding.	7/25/2019 2:14 PM
10	None	7/25/2019 1:57 PM
11	Evacuation in case of fire	7/25/2019 7:40 AM
12	Very important to improve communication infrastructure.	7/25/2019 7:39 AM
13	Communications!	7/25/2019 7:09 AM
14	None	7/25/2019 6:31 AM
15	keep the sand bags and berm in place	7/25/2019 6:22 AM
16	Better, more reliable internet and cell phone coverage.	7/25/2019 5:16 AM
17	Intelligent progress used for all areas of community. No heads in sand action as I've seen previously.	7/25/2019 4:44 AM
18	Get a REAL wireless partner in Lake City. This an issue that affects the overall health of the county. More consistent, reliable communications before, during, and after disasters increase awareness and preparedness. Emergency responders could be more effective. Disasters aside, improved service would likely have a direct economic impact to the city.	7/25/2019 4:19 AM
19	Beetle Kill Tree Protection?	7/25/2019 4:03 AM

Q1 Select affiliation (select one):

Answered: 2 Skipped: 0



ANSWER CHOICES	RESPONSES
Member of the public	50.00%
Private industry	0.00%
Nonprofit	0.00%
Government - Local	50.00%
Government - State	0.00%
Government - Federal	0.00%
Other (please specify)	0.00%
TOTAL	

Copy of Feedback Survey for Hinsdale County Draft Hazard Mitigation Plan Update

#	OTHER (PLEASE SPECIFY)
	There are no responses.

Q2 Please provide comments regarding the Draft Update to the Hinsdale County Multi-Hazard Mitigation Plan here

Answered: 1 Skipped: 1

#	RESPONSES
1	The draft Hazard Mitigation Plan for Hinsdale County was extremely well written and comprehensive, containing all likely risk scenarios and how to plan for them. Upon review, the following should be confirmed: + Page 7, section 2.1, 2nd paragraph - The town of LC is situated at the confluence of -- Lake Fork (not North Fork) + Page 11, 4th paragraph - Further forensic evidence ---- Packer MAY have acted in self defense (not - Did act) + Page 20, Table 2.4, under Flood, add something to the comment field since this is so important + Page 26 - We should have wildfire education by the West Region Wildfire Council widely available each year + page 41 - Table 2.4, under Flood line item, Probability of Occurrence should not be Highly Likely since it does not occur every year per the definition of Highly Likely - I would change this to Likely. The last significant flood was in 1921, almost 100 years ago. + page 205, CR30 drainage improvement under National Flood Insurance Program should go beyond shelf road improvement Thanks to all Town and County Commissioners and other governing bodies who have helped to construct this plan. I propose that a scaled down 2-4 page front and back version be made available to citizens on-line since most will not read 215 pages. Based on the most likely risks, what do they need to know (2-4 pages) for fire and flood predominantly. Glenn Heumann

From: Brislawn, Jeff P
Sent: Tuesday, December 10, 2019 9:56 AM
To: 'mleroux@archuletacounty.org'; 'smorrill@gunnisoncounty.org';
'mincoemc@gmail.com'; 'knowltonbk@co.laplata.co.us';
'gboyd@ouraycountyco.gov'; 'oem@sanjuancountycolorado.us';
'rwoelz@saguachecounty-co.gov'
Cc: Jami Scroggins; Phil Graham
Subject: Hinsdale County Hazard Mitigation Plan update draft
Attachments: Hinsdale HMP_Public Review Draft_November 2019_REDUCED SIZE.pdf

As a neighboring jurisdiction I am making you aware that Hinsdale County is in the final stages of completing an update of its multi-hazard mitigation plan. The plan has been out for public review but wanted to give you an opportunity to review and provide any final comments. As the consultant on this project you can direct any feedback to me. If you have any feedback or comments please provide by December 24.

Regards,
Jeff

Jeff Brislawn
Hazard Mitigation Lead/Sr Associate
Hazard Mitigation and Emergency Management Program
Office: 303-742-5315 Mobile: 303-704-5506
www.woodplc.com

wood.

-

From: Brislawn, Jeff P
Sent: Tuesday, December 10, 2019 10:00 AM
To: 'ewaters@blm.gov'; 'chad.stewart@usda.gov'; 'brian.mailett@cowildfire.org';
'chamber@lakecity.com'; 'c.richard@lfvc.org'
Cc: Jami Scroggins; Phil Graham
Subject: Hinsdale County Hazard Mitigation Plan update draft
Attachments: Hinsdale HMP_Public Review Draft_November 2019_REDUCED SIZE.pdf

As a potentially interested entity I am making you aware that Hinsdale County is in the final stages of completing an update of its multi-hazard mitigation plan. The intent of the plan is to identify hazards, vulnerabilities, and proactive strategies to reduce risks prior to an event. The plan has been out for public review but wanted to give you an opportunity to review and provide any final comments. As the consultant on this project you can direct any feedback to me. If you have any feedback or comments please provide by December 24.

Regards,

Jeff

Jeff Brislawn

Hazard Mitigation Lead/Sr Associate

Hazard Mitigation and Emergency Management Program

Office: 303-742-5315 Mobile: 303-704-5506

www.woodplc.com

wood.

-

APPENDIX C: JURISDICTIONAL ADOPTION RESOLUTIONS
