Elbert County, Colorado
Multi-Hazard Mitigation Plan Update

Prepared by Elbert County, Colorado
with assistance from

URS

One Park Square
6501 Americas Parkway, NE, Suite 900
Albuquerque, NM 87110

and

8181 East Tufts Avenue
Denver, CO 80237

July 2009

TABLE OF CONTENTS

THANKS AND ACKNOWLEDGEMENTS

The following individuals and organizations served as members of the Elbert County Hazard Mitigation Planning Committee:

LaRiea Thompson	Elbert County Office of Emergency Management
Del Schwab	Elbert County Commissioner
Gary Hartzell	Elbert County Health Department
Carolyn Parkinson, Richard Miller	Elbert County Community and Development Services
Jodi Meisman	Elbert County Communications - GIS
Bart Chambers	Elbert County Assessors Office - GIS
PJ Trostel	Elbert County Assessor
Michelle Mattive	Elbert County Sheriff's Office
Bob Murick	Elbert County Maintenance
Billy Tanner	Elbert County Building Official
Ed Ehmann, Tim Sheridan	Elbert County Road and Bridge
Janet Phillips	Elbert County Systems Specialist
Garry Rohleder	Elbert County Surveyor
Mike Phibbs	Elizabeth Police Department
Michael Gibbs	Elizabeth Public Works
Chris LaMay	Elizabeth Town Administrator
Stacey Yarrington	Elizabeth Planning Department
Tina Ceresoli	Kiowa Building Permits and Planning
Richard Morgan	Kiowa Streets and Parks
Michael Root	Kiowa Police Department
Charles Hawker	Town of Simla Trustee
TJ Steck, Kara Gerczynski	Elizabeth Fire Protection District
Dian Bowers	Kiowa Fire Protection District
Tina Barlow	Simla Fire Department
Cass Kilduff, Bryan Bowen	Rattlesnake Fire Protection District
Robert Whitehead	Kiowa Conservation District
Joanne McLain	Colorado Department of Human Services
Marion Wilson	Elbert Water and Sanitation District
Carol Beam	Kiowa Creek Community Church
Julie Baxter	URS Corporation

The following individuals and organizations also contributed to the planning process:

- Marilyn Gally, Bob Wold, Colorado Division of Emergency Management
- Kevin Houck, Colorado Water Conservation Board
- Meg Halford, Kristin Garrison, Skip Edel, Colorado State Forest Service
- Kip Nye, Colorado State University Extension Service
- Eileen Rademacher, Kiowa Conservation District
- Carolyn Hamacher, Town of Simla

Funding for the Elbert County Multi-Hazard Mitigation Plan was provided by the Federal Emergency Management Agency via grants to the Colorado Division of Emergency Management and the Colorado Water Conservation Board.

RESOLUTIONS OF ADOPTION

44 CFR requirement §201.6(c)(5): The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

Note to Reviewers: A signed resolution of adoption from each participating jurisdiction will be included in this section once the plan has been reviewed and received preliminary approval pending adoption by FEMA. A sample resolution of adoption is included on the following page.

This section includes the resolutions of adoption of the multi-hazard mitigation plan by the participating jurisdictions, which are the following:

- Elbert County
- Town of Elizabeth
- Town of Kiowa
- Town of Simla
- Elizabeth Fire Protection District
- Kiowa Fire Protection District
- Rattlesnake Fire Protection District
- Kiowa Conservation District

Resolution # _____ Adopting the Elbert County Multi-Hazard Mitigation Plan

Whereas, the (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the (Name of Government/District/Organization) fully participated in the FEMA-prescribed mitigation planning process to prepare this Multi-Hazard Mitigation Plan; and

Whereas, the Colorado Division of Emergency Management and the Federal Emergency Management Agency Region VIII officials have reviewed the "Elbert County Multi-Hazard Mitigation Plan," and approved it contingent upon this official adoption of the participating governing body; and

Whereas, the (Name of Government/District/Organization) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Elbert County Multi-Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the (Name of Government/District/Organization) demonstrates the jurisdictions' commitment to fulfilling the mitigation goals and objectives outlined in this Multi-Hazard Mitigation Plan.

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan;

Now, therefore, be it resolved, that the (Name of Government/District/Organization) adopts the "Elbert County Multi-Hazard Mitigation Plan" as an official plan; and

Be it further resolved, the (Name of Government/District/Organization) will submit this Adoption Resolution to the Colorado Division of Emergency Management and Federal Emergency Management Agency Region VIII officials to enable the plan's final approval.

Passed: _____

_____

Certifying Official

EXECUTIVE SUMMARY

The purpose of hazard mitigation planning is to reduce or eliminate long-term risk to people and property from natural hazards. Elbert County and participating jurisdictions developed this multi-hazard mitigation plan update to reduce future losses to the County and its communities resulting from natural hazards. The plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 and to achieve eligibility for the Federal Emergency Management Agency (FEMA) hazard mitigation grant programs. This plan updates Elbert County's portion of the regional 2003 Northeast Colorado Emergency Managers Association Hazard Mitigation Plan, which covered 11 counties in northeast Colorado. This plan is multi-jurisdictional and covers the following local governments that participated in its development:

- Elbert County
- Town of Elizabeth
- Town of Kiowa
- Town of Simla
- Elizabeth Fire Protection District
- Kiowa Fire Protection District
- Rattlesnake Fire Protection District
- Kiowa Conservation District

The Elbert County Office of Emergency Management provided the lead in soliciting the participation of County departments, unincorporated communities, incorporated municipalities, special districts, and other stakeholders to form the Elbert County Hazard Mitigation Planning Committee to undertake a comprehensive planning process to update the previously approved regional hazard mitigation plan. Public input on community assets, preferred mitigation strategies, and the overall plan document was also solicited. As a result, this plan represents the work of citizens, elected and appointed officials, and other interested parties in Elbert County.

The Planning Committee conducted a risk assessment to update the hazards identified and profiled in the previously approved plan. The updated hazards profiled in the 2009 plan are the following:

- Dam and Levee Failure
- Drought
- Earthquake
- Flood
- Severe Weather
- Tornado
- Wildfire
- Winter Storm

The plan also assesses the vulnerability of people, structures, and critical facilities to these hazards and examines the capabilities in place to mitigate them.

Based upon the risk assessment, the Planning Committee updated the mitigation strategy. The Planning Committee added a mission statement to the plan and revised the goals and mitigation actions for reducing risk to hazards.

Elbert County Multi-Hazard Mitigation Plan Update Mission and Goals

Mission
Reduce risk to the people and property of Elbert County from the impacts of natural hazards
Goals
1) Improve education and awareness of hazards and risk reduction measures
2) Protect critical facilities, infrastructure, and other community assets from hazards
3) Incorporate hazard mitigation into future development plans and policies
4) Enhance local mitigation capabilities, including human, technical, financial, and regulatory capabilities
5) Improve communication and coordination of mitigation activities between federal, state, and local governments and with private and non-profit organizations

The Planning Committee identified and prioritized mitigation actions to achieve these goals and support the plan's overall mission. The mitigation actions for each participating jurisdiction are summarized in the table on the following page. Each jurisdiction developed an implementation plan for each of their identified mitigation actions. The implementation plans identify the action's background information, ideas for implementation, responsible agency, timeline, cost estimate, and potential funding sources and can be found in Appendix B.

The Elbert County Multi-Hazard Mitigation Plan has been formally adopted by the Elbert County Board of County Commissioners and the governing bodies of each participating jurisdiction and will be updated within five years.

Mitigation Action Matrix

No.	Mitigation Action Description	Hazard	Responsible Agency	Goals Addressed
Elbert County Actions				
Elbert—1	Convene Elbert County Hazard Mitigation Planning Committee semi-annually to monitor, evaluate, and update the hazard mitigation plan.	Multi-Hazard	Elbert County Office of Emergency Management	3) Future Development 4) Local Capabilities 5) Communication and Coordination
Elbert—2	Continue to pursue StormReady designation.	Severe Weather, Winter Storm, Tornado	Elbert County Office of Emergency Management	4) Local Capabilities 5) Communication and Coordination
Elbert—3	Establish a hazards and risk education campaign.	Multi-Hazard	Elbert County Office of Emergency Management	1) Education 4) Local Capabilities
Elbert—4	Improve coordination between community development, building, and road and bridge departments related to the National Flood Insurance Program (NFIP).	Flood	Elbert County Community and Development Services and Office of Emergency Management	3) Future Development 4) Local Capabilities 5) Communication and Coordination
Elbert—5	Incorporate hazard mitigation in Elbert County Master Plan update.	Multi-Hazard	Elbert County Community and Development Services	3) Future Development 4) Local Capabilities
Elbert—6	Identify and prioritize stormwater drainage system improvements.	Flood	Elbert County Road and Bridge Department and Public Health Department	2) Critical Facilities 3) Future Development
Elbert—7	Develop drainage/erosion control study or project coordinating objectives of various agencies for the Town of Elbert to reduce future flood damage.	Flood	Elbert County Road and Bridge	2) Critical Facilities 3) Future Development

No.	Mitigation Action Description	Hazard	Responsible Agency	Goals Addressed
Elbert—8	Protect historical community documents through digitization project.	Multi-Hazard	Elbert County Information Technology and Administrative Departments	2) Critical Facilities 4) Local Capabilities
Elbert—9	Develop special needs populations database inventory/registry.	Multi-Hazard	Elbert County Office of Emergency Management	1) Education 4) Local Capabilities 5) Communication and Coordination
Town of Elizabeth Actions				
Elizabeth—1	Implement stormwater drainage system improvements.	Flood	Elizabeth Public Works Department	2) Critical Facilities 3) Future Development
Elizabeth—2	Update stormwater ordinance.	Flood	Elizabeth Planning Department	3) Future Development 4) Local Capabilities
Elizabeth—3	Develop special needs populations inventory/registry.	Multi-Hazard	Elizabeth Police Department	1) Education 4) Local Capabilities 5) Communication and Coordination
Elizabeth—4	Implement water delivery system improvements.	Drought	Elizabeth Public Works Department	2) Critical Facilities
Town of Kiowa Actions				
Kiowa—1	Assess condition/level of protection of Kiowa levee and upgrade and maintain.	Flood, Dam/Levee Failure	Town of Kiowa	2) Critical Facilities
Kiowa—2	Mitigate flood risk to Kiowa schools.	Flood	Town of Kiowa	2) Critical Facilities
Kiowa—3	Participate in floodplain map modernization process with Elbert County and update flood damage prevention ordinance as needed.	Multi-Hazard	Kiowa Water and Planning	3) Future Development 4) Local Capabilities
Kiowa—4	Implement stormwater drainage system improvements.	Flood	Kiowa Street Department, Town Administrator	2) Critical Facilities 3) Future Development

No.	Mitigation Action Description	Hazard	Responsible Agency	Goals Addressed
Kiowa—5	Implement water delivery system improvements.	Drought	Kiowa Utilities	2) Critical Facilities
Kiowa—6	Assess and designate shelters and distribute information to public/agencies.	Multi-Hazard	Town of Kiowa	1) Education 2) Critical Facilities 5) Communication and Coordination
Kiowa—7	Adopt a stormwater ordinance.	Flood	Town Administrator	3) Future Development 4) Local Capabilities
Kiowa—8	Develop education and incentives program to encourage water savings measures by citizens.	Drought	Town of Kiowa	1) Education 4) Local Capabilities
Kiowa—9	Assess protective measures needed for historic structures.	Multi-Hazard	Town of Kiowa	2) Critical Facilities
Town of Simla Actions				
Simla—1	Obtain back-up generators for critical facilities.	Multi-Hazard	Simla Public Works and Water/Sewer Departments	2) Critical Facilities
Simla—2	Assess and designate shelters for tornado and blizzard victims.	Tornado Winter Storm	Simla Police Department	2) Critical Facilities
Simla—3	Improve stormwater drainage system.	Flood	Simla Public Works	2) Critical Facilities 3) Future Development
Elizabeth Fire Protection District Actions				
Elizabeth FPD—1	Develop an Elbert County Wildfire Protection Program that includes public information, resources, and special events to reduce wildfire risk.	Wildfire	Elbert County Fire Chiefs Association	1) Education
Kiowa Fire Protection District Actions				
Kiowa FPD—1	Develop an Elbert County Wildfire Protection Program that includes public information, resources, and special events to reduce wildfire risk.	Wildfire	Elbert County Fire Chiefs Association	1) Education
Rattlesnake Fire Protection District Actions				

No.	Mitigation Action Description	Hazard	Responsible Agency	Goals Addressed
Rattlesnake FPD—1	Develop an Elbert County Wildfire Protection Program that includes public information, resources, and special events to reduce wildfire risk.	Wildfire	Elbert County Fire Chiefs Association	1) Education
Kiowa Conservation District Actions				
KCD—1	Form task force to improve coordination with conservation districts, assess condition of dams, and identify funding sources for repair and maintenance.	Dam and Levee Failure	Kiowa Conservation District, Double L Conservation District	5) Communication and Coordination
KCD—2	Minimize new development in dam inundation areas and educate public on flood control dam structures and easements.	Dam and Levee Failure	Kiowa Conservation District, Double L Conservation District, Elbert County Community Development Services	1) Education 3) Future Development

CHAPTER 1 INTRODUCTION

This chapter provides information on the purpose and participating jurisdictions in the Elbert County Multi-Hazard Mitigation Plan Update, describes federal hazard mitigation planning requirements and grant programs, and lists an outline of the plan's organization.

1.1 Plan Purpose and Participating Jurisdictions

Elbert County, three incorporated municipalities, and four special districts prepared this multi-jurisdictional, local hazard mitigation plan to better protect the people and property of the County from the impacts of natural hazard events. The 2009 plan updates Elbert County's portion of the regional 2003 Northeast Colorado Emergency Managers Association Hazard Mitigation Plan. The 2003 plan covered 11 northeast Colorado counties. The 2009 plan only addresses the Elbert County planning area, which includes the geographical areas within the County's jurisdictional boundaries and the towns of Elizabeth, Kiowa, and Simla. Table 1.1 shows the jurisdictions that participated in the 2003 plan and the jurisdictions participating in the 2009 plan. Unless otherwise specified in this plan, 'Elbert County' references the unincorporated areas of Elbert County; the towns of Elizabeth, Kiowa, and Simla; and the participating districts.

Table 1.1 Multi-Jurisdictional Participation in 2003 Plan and 2009 Plan Update

2003 Participating Jurisdictions	2009 Participating Jurisdictions
Elbert County	Elbert County
– Town of Elizabeth	Town of Elizabeth
– Town of Simla	Town of Simla
– Town of Kiowa	Town of Kiowa
– Kiowa Conservation District	Kiowa Conservation District
Cheyenne County	Elizabeth Fire Protection District
Kit Carson County	Kiowa Fire Protection District
Lincoln County	Rattlesnake Fire Protection District
Logan County	
Morgan County	
Phillips County	
Sedgwick County	
Washington County	
Weld County	
Yuma County	

Note: Each of the other 10 counties from the 2003 plan included multiple participating jurisdictions.

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." Mitigation creates safer communities by reducing loss of life and property damage. Hazard mitigation planning is the process through which hazards that threaten communities are identified and profiled, likely impacts of those hazards are assessed, and mitigation strategies to lessen those impacts are identified, prioritized, and implemented. 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).

This plan demonstrates the communities' commitment to reducing risks from hazards and serves as a tool to help decision makers direct and coordinate mitigation activities and resources, including local land use policies.

1.2 Mitigation Planning Requirements

Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) amending the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the act's previous mitigation planning section (409) and replacing it with a new mitigation planning section (322). This new section emphasized the need for State, Tribal, and local entities to closely coordinate mitigation planning and implementation efforts. In addition, it provided the legal basis for the Federal Emergency Management Agency's (FEMA) mitigation plan requirements for mitigation grant assistance.

To implement these planning requirements, FEMA published an Interim Final Rule in the *Federal Register* on February 26, 2002 (FEMA 2002a), 44 CFR Part 201 with subsequent updates. The planning requirements for local entities are identified in their appropriate sections throughout this plan. FEMA's October 31, 2007 changes to 44 CFR Part 201 combined and expanded flood mitigation planning requirements with local mitigation plans (44 CFR §201.6). It also required participating National Flood Insurance Program (NFIP) communities' risk assessments and mitigation strategies to identify and address repetitively flood damaged properties.

The July 01, 2008, FEMA crosswalk, which documents compliance with 44 CFR, is provided in Appendix A.

1.3 Grant Programs Requiring Hazard Mitigation Plans

Local hazard mitigation plans now qualify communities for the following federal mitigation grant programs:

- Hazard Mitigation Grant Program (HMGP)

- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- Severe Repetitive Loss (SRL)
- Repetitive Flood Claim (RFC)

The first two of the grant programs listed above are authorized under the Stafford Act and DMA 2000, while the last three are authorized under the National Flood Insurance Act and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act. The HMGP is a state competitive grant program which is directly disaster funded. Whereas the other programs, PDM, FMA, RFC, and SRL, are competitive and rely on specific pre-disaster grant funding sources, sharing several common elements. In 2008, FEMA combined the multi-hazard PDM program with the FMA, RFC, and SRL programs into a unified HMA program application cycle. The intent of this alignment is to enhance the quality and efficiency of grant awards on an allocation and competitive basis to state and local entities for worthwhile, cost-beneficial activities designed to reduce the risks of future damage in hazard-prone areas.

Disaster Funded Mitigation Assistance

Hazard Mitigation Grant Program: Provides grants to States, Tribes, and local entities to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. Projects must provide a long-term solution to a problem, for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The amount of funding available for the HMGP under a particular disaster declaration is limited. The program may provide a state or tribe with up to 20 percent of the total disaster grants awarded by FEMA. The cost-share for this grant is 75 percent federal/25 percent non-federal.

Hazard Mitigation Assistance Programs

Pre-Disaster Mitigation Program: Provides funds to State, Tribes, and local entities, including public universities, for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. PDM grants are awarded on a nationally competitive basis. Like HMGP funding, a PDM project's potential savings must be more than the cost of implementing the project. In addition, funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The cost-share for this grant is 75 percent Federal/25 percent non-Federal.

Flood Mitigation Assistance Grant Program: The goal of the FMA grant program is to reduce or eliminate flood insurance claims under the National Flood Insurance Program (NFIP).

Particular emphasis for this program is placed on mitigating repetitive loss properties. Repetitive loss properties are properties for which two or more NFIP losses of at least $1,000 each have been paid within any 10-year period since 1978. Grant funding is available for three types of grants, including planning, project, and technical assistance. Project grants, which use the majority of the program's total funding, are awarded to states, tribes, and local entities to apply mitigation measures to reduce flood losses to properties insured under the NFIP. The cost-share for this grant is 75 percent federal/25 percent non-federal.

Severe Repetitive Loss Program: Provides funding to reduce or eliminate the long-term risk of flood damage to residential structures insured under the NFIP. Structures considered for mitigation must have at least four NFIP claim payments over $5,000 each, when at least two such claims have occurred within any 10-year period, and the cumulative amount of such claims payments exceeds $20,000; or for which at least two separate claims payments have been made with the cumulative amount of the building portion of such claims exceeding the value of the property, when two such claims have occurred within any 10-year period. The cost-share for this grant is 75 percent federal/25 percent non-federal.

Repetitive Flood Claims Program: Provides funding to reduce or eliminate the long-term risk of flood damage to residential and nonresidential structures insured under the NFIP. Structures considered for mitigation must have had one or more claim payments for flood damages. All RFC grants are eligible for up to 100 percent federal assistance.

1.4 Plan Organization

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

- **Chapter 1: Introduction** describes the participating jurisdictions, the plan's purpose, hazard mitigation planning requirements, and federal hazard mitigation grant programs.
- **Chapter 2: Community Profile** provides a general description of Elbert County, including its location, geography, climate, history, population, economy, and government.
- **Chapter 3: Planning Process** describes the planning process used to develop the plan update, including how it was prepared, who was involved in the process, and how the public was involved. This chapter also describes how each section of the previously approved plan was updated. Specific plan update changes are noted throughout the document as well.
- **Chapter 4: Risk Assessment** identifies and profiles the hazards that could affect Elbert County and assesses vulnerability to those hazards. It updates information from the previously approved plan, provides an inventory of critical facilities and other community assets in the County, and describes land use and development trends. Chapter 4 also includes a capability assessment of the existing plans, programs, and policies in Elbert County related to mitigation.
- **Chapter 5: Mitigation Strategy** updates the previous mitigation strategy based on the risk assessment. The mitigation strategy consists of a mission statement, goals, and mitigation actions.

- **Chapter 6: Plan Maintenance** provides a formal process for monitoring, evaluating, and updating the plan; discusses how to incorporate the plan into existing planning mechanisms; and plans for continued public involvement.
- **Appendix A: Plan Review Crosswalk** provides the July 01, 2008, FEMA crosswalk for local hazard mitigation plans documenting compliance with 44 CFR.
- **Appendix B: Action Implementation Plans** includes a one-page implementation plan for each mitigation action identified in Chapter 5 Mitigation Strategy.
- **Appendix C: Planning Process Documentation** compiles agendas, sign-in sheets, press releases, and other materials documenting the planning process.
- **Appendix D: Mitigation Action Evaluation** includes the worksheets used by the Elbert County Hazard Mitigation Planning Committee to identify and prioritize mitigation actions.
- **Appendix E: Plan Maintenance Forms** provides a mitigation action progress reporting form and an annual plan review questionnaire to assist in evaluating and maintaining the plan as described in Chapter 6 Plan Maintenance.
- **Appendix F: References** provides references for information sources cited in the plan.

CHAPTER 2 COMMUNITY PROFILE

This section describes the location, geography, climate, history, population, economy, and government of Elbert County and the three participating municipalities: Kiowa, Elizabeth, and Simla.

2.1 Location, Geography, and Climate

Location

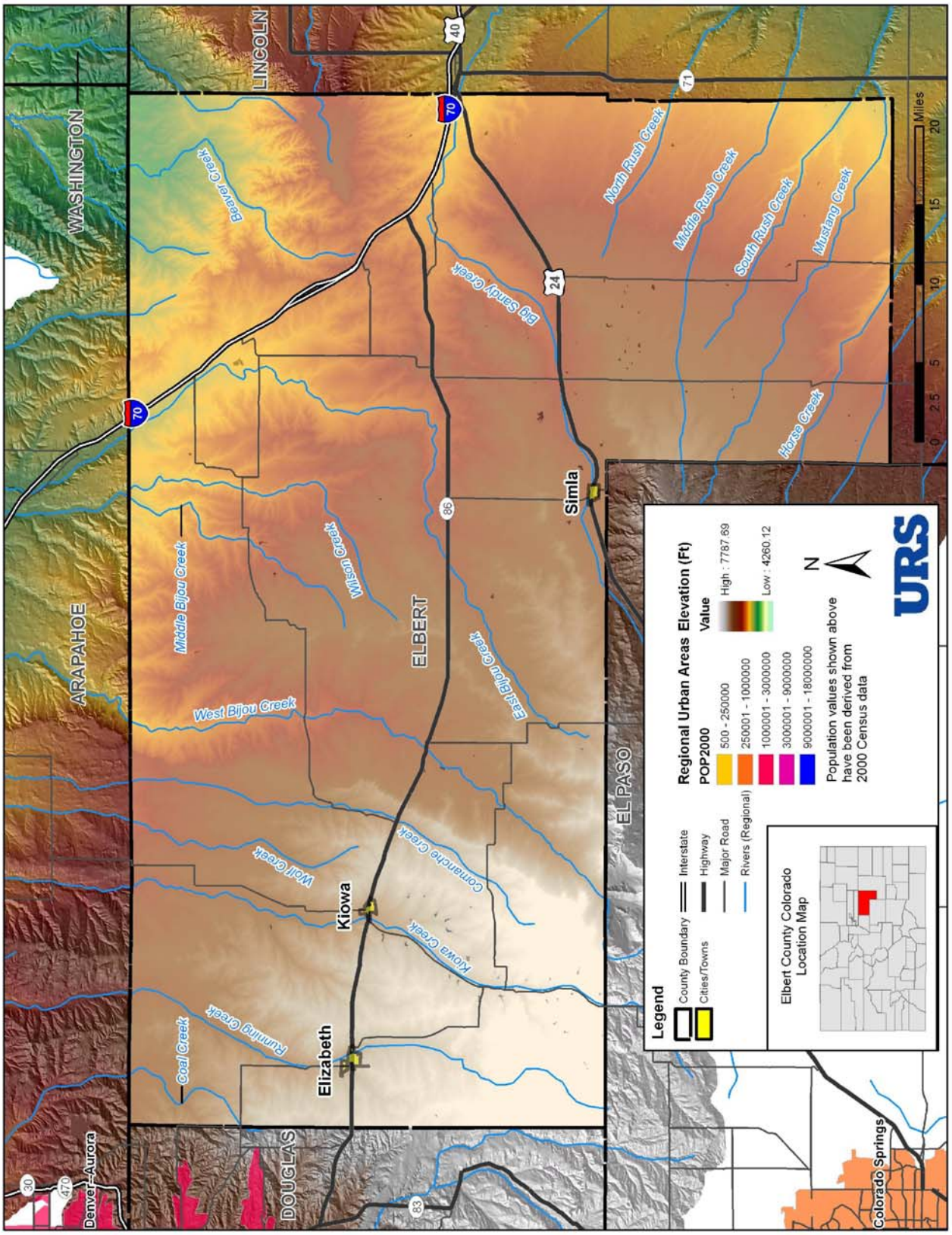
Elbert County is located between the foothills of the Rocky Mountains and the eastern plains of Colorado. The county seat is approximately 40 miles southeast of Colorado's capital and largest city, Denver. Elbert County is also only 30 miles northeast of Colorado's second largest city, Colorado Springs. Figure 2.1 shows a map of Elbert County.

The county seat, the Town of Kiowa, is located in the central-western portion of the county. The largest town in Elbert County, Elizabeth, is located in the western portion of the County, closest to Denver. The Town of Simla is on the southern edge of the County adjacent to El Paso County. The towns of Elizabeth and Kiowa are located on State Highway 86, which connects these towns to Denver to the west and Interstate 70 to the east. The Town of Simla is located on State Highway 24 approximately 48 miles from Colorado Springs. Highway 24 also serves as access to Interstate 70.

Geography

Elbert County's geography illustrates the transition between Colorado's western mountainous counties to the eastern plains counties. Elevations in Elbert County range from approximately 7,000 feet above sea level in the southwest to approximately 5,000 feet in the northeast. The County consists of 1,854 square miles of hills and rolling plains and stretches for 50 miles east and west. There are a number of rivers and small streams traversing the county feeding into agricultural ditches and eventually transporting mountain snow runoff into the Missouri River basin to the north and the Arkansas River basin to the south.

Figure 2.1 Map of Elbert County



Climate

Elbert County receives on average 16 inches of rain and 247 days of sunshine per year. The average July high temperature is 86 degrees Fahrenheit. The average January low temperature is 16 degrees. The climate can be dramatically different in different portions of the county, based on the local topography.

Southwest Elbert County, where the Town of Elizabeth is located, includes the most northern portions of the Palmer Divide. The Palmer Divide is a ridge in central Colorado that separates the Arkansas River basin from the Missouri River basin. The divide extends from the Rocky Mountains eastward toward the eastern plains along the county line between Douglas County and El Paso County.

The Town of Elizabeth's location at the northern end of the Palmer Divide provides an elevation of 6,648. This terrain feature is the cause of several small-scale weather patterns. Although the Palmer Divide is perpendicular to the mountains, the elevation results in similar weather to the foothills, especially during snowstorms. Weather in the central and eastern portions of the County are quite different and generally drier. Large temperature changes occur regularly and the threat of dramatic weather is always present. Winters are generally mild although blizzards and wind blown snow are common. Summers are typically dry and hot, and the eastern plains can experience severe hail storms.

2.2 History

Incorporated on February 13, 1874, Elbert County originally stretched from its present western boundary all the way to the Kansas state line. Carved out of Douglas and Greenwood counties (the remainder of Greenwood County was dissolved into Bent County) in 1889 by an act of the State Legislature, Cheyenne, Kit Carson and Lincoln counties were created from the eastern half of Elbert County. The County was named for Samuel Hitt Elbert, the governor of the Territory of Colorado when it was formed.

The first settlers to Elbert County were attracted to the large forests of ponderosa pine growing along the Palmer Divide, which were quickly recognized as a source of lumber for the growing town of Denver. Several sawmills were established within Elbert County in the early 1860s. One of these, the Webber Mill, was the site of present-day Elizabeth. The mills drew people to the area, and other settlers began arriving to farm and ranch on the lower elevations (Elbert County Museum, 2009).

The Town of Kiowa was settled in 1859 along the banks of Kiowa Creek and was originally a stage stop. Trails, such as the Smoky Hill South (also known as the Starvation Trail), the Butterfield Overland Dispatch, and Wells Fargo made their stops in Kiowa on their route to Denver. The original settlement was named Wendling, after Henry Wendling, one of the early settlers in the area. In 1874, Middle Kiowa was named the county seat, and in 1912, the town

was incorporated and the word middle was dropped. The same year the newly built brick courthouse was completed and dedicated with a bear barbecue.

Although farming and ranching practices continue in the central and southeastern portions of the County, in recent decades the western portion of the County has served as a large lot rural option for employees in Denver and Colorado Springs. The Town of Elizabeth is particularly influenced by its proximity to the Denver metropolitan area. Approximately 80 percent of the population of Elbert County lives in western portions of the unincorporated County and around the Town of Elizabeth. Most residents commute to Denver and its southern suburbs to work and shop, although service uses are increasing (Town of Elizabeth website, 2009).

2.3 Population

Elbert County has grown by 16.2 percent since the 2000 U.S. Census. The estimated 2007 County population was 23,092. There are approximately 23 persons per square mile. The majority of the County's population is in unincorporated, rural areas. Population estimates for the year 2007 for each of the incorporated municipalities and unincorporated Elbert County are provided in Table 2.1.

Table 2.1 Elbert County Population

Jurisdiction	2000	2007
Town of Elizabeth	1,434	1,456
Town of Kiowa	581	610
Town of Simla	663	724
Unincorporated Elbert County	17,194	20,302
Total Elbert County	**19,872**	**23,092**

Source: Colorado Department of Local Affairs, www.dola.colorado.gov/.

2.4 Economy

The total number of employees working in Elbert County in the second quarter of 2008 was 3,505. The largest major industry sector was Education Services (21 percent), followed by Construction (20 percent), and Accommodation and Food Services (10 percent). The unemployment rate in Elbert County is 7.9 percent, with a negative job growth of –8.0 percent, although the future job growth over the next 10 years is predicted to be approximately 16 percent.

Economic conditions in Elbert County reflect those of other similar rural counties, where most businesses are owned and operated by local citizens and few manufacturing or industrial jobs exist. Recent development growth in the western portion of the County has brought an increase in the service industry, such as food stores, restaurants, banks, and convenience retail. The 1996

Elbert County Master Plan includes an economic development goal that encourages manufacturing, distribution, agriculture, wholesale and retail trade, in order to ensure financial stability. Further, the plan seeks to encourage economic development while ensuring the preservation of the rural character of the County. Taxes remain low, with a sales tax in Elbert County of 2.9 percent. The income per capita is $31,449, and the median household income is $77,209. The income tax is 5.0 percent.

2.5 Government

A Board of County Commissioners governs the County. The County government includes 21 departments from the Assessor to Veterans Services, and includes Building, Community and Development Services, Emergency Management, Health and Environment, Road and Bridge, and the Sheriff's Office. The County includes the unincorporated small towns of Agate, Elbert, and Matheson. The incorporated towns of Kiowa, Elizabeth, and Simla are governed by Boards of Trustees. Town departments include office staff, law enforcement, and public works.

CHAPTER 3 PLANNING PROCESS

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

Requirement §201.6(b): An open public involvement process is essential to the development of an effective plan. On order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process, 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 a 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.

Requirement §201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process and how the public was involved.

This chapter describes 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.

Plan Update: In the 2009 update planning process, the Elbert County Elbert County Hazard Mitigation Planning Committee (Planning Committee) reviewed and updated each of the sections of the previously approved plan, including improving organization and formatting and adding substantially more in-depth information specific to Elbert County and its participating jurisdictions. The process for updating each section is described in the planning process steps in Section 3.3 below as well as in each relevant plan chapter.

3.1 Hazard Mitigation Planning Committee

Elbert County contracted with URS Corporation (URS) in January 2009 to assist in updating their multi-jurisdiction, multi-hazard mitigation plan by facilitating the hazard mitigation planning process and developing the plan document. The Elbert County Office of Emergency Management (OEM) and URS worked together to convene the Planning Committee to guide the planning process and make key decisions. A invite list for the Planning Committee is included in Appendix C. The agencies that participated in the Planning Committee are the following:

- Elbert County Office of Emergency Management
- Elbert County Commissioners Office
- Elbert County Health Department
- Elbert County Community and Development Services
- Elbert County Communications
- Elbert County Assessors Office
- Elbert County Maintenance
- Elbert County Building Official
- Elbert County Road and Bridge
- Elbert County Surveyor
- Elbert Water and Sanitation District

- Elizabeth Police Department
- Elizabeth Public Works
- Elizabeth Town Manager
- Kiowa Planning/Town Manager's Office
- Elizabeth Fire Protection District
- Kiowa Fire Protection District
- Simla Fire Department
- Rattlesnake Fire District
- Kiowa Conservation District
- Colorado State University Extension Service
- Colorado State Forest Service
- Colorado Department of Human Services
- Colorado Division of Emergency Management
- Colorado Water Conservation Board
- URS

Participants in the Planning Committee contributed to the planning process by:

- Attending and participating in meetings
- Collecting data
- Making decisions on plan process and content
- Submitting mitigation action implementation worksheets
- Reviewing plan drafts
- Coordinating and assisting with the public input process
- Coordinating the final adoptions of the plan

The plan was prepared over seven months. Table 3.1 lists the dates and agenda items for the meetings of the Planning Committee. Full agendas and sign-in sheets are included in Appendix C: Planning Process Documentation.

Table 3.1 Elbert County Hazard Mitigation Planning Committee Meetings

Meeting Date	Meeting Agenda
Kickoff: February 17, 2009	Convene Hazard Mitigation Planning Committee; Introduce the Disaster Mitigation Act of 2000 and purpose and requirements of hazard mitigation planning; Discuss the planning process; Begin hazard identification and data collection process.
#2: April 14, 2009	Finalize outreach strategy; Review results of risk assessment; Define goals, objectives, and mitigation actions; Update goals and objectives.
#3: May 12, 2009	Discuss mitigation categories and examples; Identify mitigation actions by goal and hazard type.
#4: May 19, 2009	Prioritize mitigation actions; Determine process to monitor, evaluate, and update the plan.

3.2 Multi-Jurisdictional Participation

Elbert County invited incorporated cities and special districts within the County to participate in the update to the multi-jurisdictional plan. The Disaster Mitigation Act of 2000 requires that each participating jurisdiction participates in the planning process and formally adopts the mitigation

plan. Table 3.2 records the attendance of representatives from each participating jurisdiction at the Planning Committee meetings. The complete list of invited participants and sign-in sheets for each meeting are included in Appendix C: Planning Process Documentation.

Table 3.2 Jurisdictional Participation in Hazard Mitigation Planning Committee Meetings

Meeting Date (2009)	Elbert County	Elizabeth	Kiowa	Simla	Elizabeth FPD	Kiowa FPD	Simla FPD	Rattle-snake FPD	Kiowa Conservation District
Kickoff: February 17	X	X		X	X		X	X	X
#2: April 14	X	X	X		X	X		X	
#3: May 12	X	X	X	X	X	X	X		X
#4: May 19	X	X		X	X				X

3.3 10-Step Planning Process

The Planning Committee used FEMA's 10-step planning process integrating recommendations from FEMA's *Local Multi-Hazard Mitigation Planning Guidance* (2008), the Local Mitigation Planning How-To Guides, and the 10-step planning process used for FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. Table 3.3 shows how the modified 10-step process corresponds with the planning requirements of the Disaster Mitigation Act.

Table 3.3 10-Step Planning Process Used to Develop the Plan

Disaster Mitigation Act Requirements 44CFR 201.6	Modified CRS Planning Steps
1 Organize Resources	
201.6(c)(1)	1 Organize the Planning Effort
201.6(b)(1)	2 Involve the Public
201.6(b)(2) and (3)	3 Coordinate with Other Departments and Agencies
2 Assess Risks	
201.6(c)(2)(i)	4 Identify the Hazards
201.6(c)(2)(ii)	5 Assess the Risks
3 Develop the Mitigation Plan	
201.6(c)(3)(i)	6 Set Goals
201.6(c)(3)(ii)	7 Review Possible Activities
201.6(c)(3)(iii)	8 Draft an Action Plan
4 Implement the Plan and Monitor Progress	
201.6(c)(5)	9 Adopt the Plan
201.6(c)(4)	10 Implement, Evaluate, and Revise the Plan

Source: FEMA Local Multi-Hazard Mitigation Planning Guidance, 2008

The following section provides a narrative description of the planning process used to update the plan.

Phase I Organize Resources

Step 1: Organize the Planning Effort

The planning process began with a kickoff meeting in Kiowa, Colorado, on February 17, 2009. Elbert County OEM emailed letters of invitation to the kickoff meeting to county, municipal, district, state, and other stakeholder representatives to form the Hazard Mitigation Planning Committee discussed in Section 3.1. This list is included in Appendix C.

During the kickoff meeting, URS presented information on the scope and purpose of the plan, participation requirements of the Planning Committee and participating jurisdictions, and an overview of the planning process and schedule. The Planning Committee discussed ideas for involving the public (Step 2) and coordination with other agencies and departments (Step 3).

Step 2: Involve the Public

At their first two meetings, the Planning Committee discussed different options for involving the public in the hazard mitigation planning process and finalized the following outreach plan:

Public Input Questionnaire—Elbert County OEM posted an informational flyer on the Elbert County Multi-Hazard Mitigation Plan with an attached questionnaire designed to gain input on public priorities for risk reduction on their website, and also emailed the flyer to stakeholders to gain their input. A copy of the flyer and questionnaire and a summary of the results are provided in Appendix C: Planning Process Documentation.

Elbert County Planning Commission Presentation—Elbert County OEM and URS updated the Elbert County Planning Commission on the status of the planning process at their regularly scheduled meeting on May 14, 2009. This meeting was open to the pubic. The agenda is included in Appendix C: Planning Process Documentation.

Public Review of Plan Draft: After comments from the Planning Commission were incorporated into a draft of the multi-hazard mitigation plan, it was made available for public review and comment. The participating jurisdictions worked together to make the plan for public review in electronic or hard copy from July 1-15, 2009, at the following locations:

- Elbert County Office of Emergency Management webpage: http://www.elbertcounty-co.gov/dept_emergency.php
- Elbert County Government Building
- Elbert County libraries located in Elizabeth, Kiowa, Simla, and Elbert
- Elizabeth Town Hall
- Kiowa Town Hall
- Simla Town Hall
- Agate Post Office
- Matheson Post Office

The Planning Committee publicized the availability of the draft plan by issuing press releases to the *Elbert County News, West Elbert County News,* and the *Ranchland News* and sending an email to the Community Distribution List. The Community Distribution List includes about 600 email addresses for citizens who sign up for community notices, all County employees, municipal departments, school principals and superintendants, and many more. Copies of the notifications are available in Appendix C: Planning Process Documentation.

Public comment received on the plan is included in Appendix C. Information provided through public comment on the vulnerability of the Town of Agate's water line, pump house, and treatment plan was included in the risk assessment.

Step 3: Coordinate with Other Departments and Agencies

Elbert County OEM invited a range of local, state, and federal departments and agencies and other interested parties to be involved in the Elbert County Hazard Mitigation Planning Committee. This list is included in Appendix C: Planning Process Documentation. The Planning Committee also invited additional stakeholders using the Community Distribution List

referenced in the previous section to 1) complete the public input questionnaire by email and 2) review and comment on the plan draft. The emergency managers of neighboring counties—Arapahoe, Douglas, El Paso, and Lincoln—were also emailed invitations to comment on the plan draft.

As part of the coordination with other departments and agencies, the Planning Committee reviewed and incorporated existing plans, studies, reports, and technical information. This information was used in the development of the hazard identification, vulnerability assessment, and capability assessment in Chapter 4 and in the formation of goals and mitigation actions in Chapter 5. These sources are documented throughout the plan and in Appendix F: References.

Phase II Assess Risks

Step 4: Identify the Hazards

At the Planning Committee's kickoff meeting, URS presented information on the requirements for the risk assessment section of a hazard mitigation plan. The Planning Committee reviewed the hazards identified and profiled in the previously approved plan and the list of hazards FEMA recommends for consideration in mitigation planning. The Planning Committee discussed the past and potential impacts of these hazards on communities in Elbert County. They decided to eliminate one hazard due to low risk and insufficient data (landslide) and two hazards due to lack of relevance with this plan's purpose and scope (noxious weeds and wildlife and insects). Section 4.1 Hazard Identification provides more information on the update of the plan's hazard identification.

Step 5: Assess the Risks

A profile of each identified hazard was updated using the best available GIS data, online data sources, and existing plans and reports. The profiles included a hazard description, geographic location, past occurrences, probability of future occurrences, and magnitude/severity (extent) for each hazard. Members of the Planning Committee used a worksheet to provide information to URS about hazard data sources and past events in Elbert County. The profiles also describe overall vulnerability of each jurisdiction to each hazard and identify structures and estimate potential losses to structures in identified hazard areas.

Participating jurisdictions inventoried their assets at risk to natural hazards—overall and in identified hazard areas—and analyzed development trends in hazard areas. They provided this information through worksheets and GIS data.

Each participating jurisdiction also completed a mitigation capability assessment, which identifies the existing government programs, policies, regulations, ordinances, and plans that mitigate or could be used to mitigate risk to disasters. Participating jurisdictions collected information on their regulatory, personnel, fiscal, and technical capabilities, as well as ongoing

initiatives related to interagency coordination and public outreach. This assessment updated information from the 2003 plan and is summarized in Section 4.5 Capability Assessment.

Phase III Mitigation Strategy

Step 6: Set Goals

At Meeting #2, the Planning Committee reviewed the goals and objectives from the previously approved plan, as well as the goals of the Colorado State Natural Hazards Mitigation Plan. The Planning Committee revised these goals, removed the objectives, and developed an overall mission statement for the plan. These changes are documented in Chapter 5 Mitigation Strategy

Step 7: Review Possible Activities

The responsible agency for each mitigation action identified in the previously approved plan provided written feedback to the Planning Committee on the status of the action—completed, uncompleted, or ongoing. This written update is included in Appendix D.

The Planning Committee reviewed the status of previous actions and identified new mitigation actions at their third meeting on May 12, 2009. They prioritized mitigation actions at their fourth meeting on May 19, 2009. Details on this process are included in Chapter 5 Mitigation Strategy.

The Planning Committee also identified the responsible agency for implementing each action. The identified agencies then completed a mitigation action implementation plan for each action. The purpose of these plans is to document background information, ideas for implementation, alternatives, responsible office, partners, potential funding, cost estimates, benefits, and timeline for each identified action. Each jurisdiction was responsible for completing their specific mitigation action implementation plans.

Step 8: Draft the Plan

URS developed a first complete draft of the plan document for review by the Planning Committee. Once their comments were incorporated, a second draft was made available online and in hard copy for review and comment by the public and other agencies and interested stakeholders. This review period was from July 1-15, 2009. Methods for inviting interested parties and the public to review and comment on the plan were discussed in Steps 2 and 3, and materials are provided in Appendix C. Comments were integrated into a final draft for submittal to the Colorado Division of Emergency Management, Colorado Water Conservation Board, and FEMA Region VIII.

Phase IV Plan Maintenance

Step 9: Adopt the Plan

The governing bodies of each participating jurisdiction adopted the plan. Copies of resolutions of adoption are included in the Resolutions of Adoption section of the plan.

Step 10: Implement, Evaluate, and Revise the Plan

The 2003 plan did not include a process for monitoring, evaluating, and maintaining the plan. The 2009 Planning Committee developed and agreed upon a method and schedule for plan implementation and for monitoring, evaluating, and maintaining the plan over time during Meeting #4 on May 19, 2009. This information is described in Chapter 6 Plan Maintenance.

CHAPTER 4 RISK ASSESSMENT

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

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

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

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

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

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

This chapter identifies and profiles the hazards that could affect Elbert County and assesses vulnerability to those hazards. The risk assessment allows Elbert County communities to better understand their potential risk and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This risk assessment chapter is divided into six parts:

- **Section 4.1 Hazard Identification** identifies the hazards that threaten the planning area and describes why some hazards have been omitted from further consideration.
- **Section 4.2 Hazard Profiles and Vulnerability** describes the location of the hazard in the planning area, previous occurrences of hazard events, probability of future occurrence, and potential magnitude or severity for each identified hazard. This section also describes overall vulnerability to each hazard and identifies structures and estimates potential losses to structures in identified hazard areas.
- **Section 4.3 Community Asset Inventory** assesses the County's total exposure to natural hazards and considers assets at risk, including critical facilities and infrastructure; natural, historic, and cultural resources; and economic assets. Social vulnerability is also assessed.
- **Section 4.4 Land Use and Development Trends** analyzes trends in population growth, housing demand, and land use patterns.

- **Section 4.5 Capability Assessment** identifies the existing programs, policies, and plans that mitigate or could be used to mitigate risk to disasters for each jurisdiction.
- **Section 4.6 Risk Assessment Summary** summarizes the key issues identified in the risk assessment and forms the foundation for the mitigation strategy.

Plan Update: The Planning Committee updated all sections of the risk assessment in the previously approved plan because much of the data was not very specific to Elbert County. All data from the 2003 plan were incorporated and greatly augmented in the 2009 planning process. Specific changes of note are discussed within each section of the risk assessment chapter.

4.1 Hazard Identification

This section identifies the hazards that are likely to affect Elbert County. The Planning Committee considered the hazards identified in the previously approved Northeast Colorado Emergency Managers' Association Hazard Mitigation Plan (2003 plan), the hazards identified in the State of Colorado Natural Hazards Mitigation Plan (2007), and the hazards recommended by the Federal Emergency Management Agency (FEMA) for consideration in a natural hazard mitigation plan (FEMA publication 386-2, *Understanding Your Risks: Identifying Hazards and Estimating Losses* (2002)).

The Planning Committee also reviewed events that triggered federal and/or state disaster declarations. Disaster declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and/or the Small Business Administration. FEMA also issues emergency declarations, which are more limited in scope and do not warrant the long-term federal recovery programs of major disaster declarations.

Table 4.1 lists state and federal disaster declarations in which Elbert County was a designated County. The majority of the disaster declarations are for flood events (5) followed by snow events (2). There is one state declaration for a wildfire in 1987.

Table 4.1 FEMA and State Disaster Declaration History in Elbert County, 1965-2008

Year	Event Type	Disaster Number	# Designated Counties
2007	Snow	FEMA 3270-EM	15 counties
2003	Snow	FEMA-3185-EM	29 counties
2000	Flood	State	Elbert County
1999	Severe Storms, Flooding, Mudslides, and Landslides	FEMA-1276-DR	12 counties
1997	Flooding	FEMA-1186-DR	6 counties
1987	Wildfire	State	3 counties
1965	Tornadoes, Severe Storms, Flooding	FEMA-200-DR	33 counties

Source: State of Colorado Natural Hazards Mitigation Plan; Public Entity Risk Institute Presidential Disaster Declaration Site, www.peripresdecusa.org/mainframe.htm.

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

Table 4.2 lists USDA disaster declarations in Elbert County from 2005 to 2007; consistent older data was not available. During this time period, USDA declarations affecting Elbert County were most common for drought and winter storm hazards.

Table 4.2 USDA Disaster Declaration History in Elbert County, 2005-2007

Year	Disaster Number	Hail	Drought	Insect	Wildfire	High Wind	Extreme Heat	Below Normal Temp.	Winter Storm	Excessive Moisture
2005	S2188a		X							
2005	S2188b	X				X				X
2006	N870							X	X	
2006	S2327				X	X	X			
2006	S2329		X	X		X	X		X	
2006	S2382		X							
2006	N870							X	X	
2003	S1797		X							

Source: USDA Farm Service Agency, www.fsa.usda.gov/Internet/FSA_File/2005_2007eligible_county.xls.

At the kickoff meeting, the Planning Committee considered each hazard based upon the prior occurrence as part of a federal or state disaster declaration, their understanding of relative risk,

and whether the hazard could be mitigated. The Planning Committee determined that eight hazards pose the greatest threat to the County, as listed in the table below.

Table 4.3 Hazard Identification in 2003 Plan and Updated 2009 Plan

2003 Hazard Identification	2009 Hazard Identification
Dam Failure Flooding	Dam and Levee Failure
Drought	Drought
Earthquake	Earthquake
Flood	Flood
Hail and Severe Storms	Severe Weather: includes Windstorm, Lightning, and Hail
Landslides	Not included in 2009 plan. No past events or hazard areas identified in Elbert County. The 2003 plan included landslides for portions of Northeast Colorado that are within known hazard areas that do not include Elbert County.
Noxious Weeds	Not included in 2009 plan. This hazard is better addressed by other agencies and plans and is not eligible for FEMA mitigation grant programs.
Other Wind Hazards	Included as Windstorm in Severe Weather hazard
Severe Winter Storms	Winter Storm
Tornadoes	Tornado
Wildland Fire/Grassland Fire	Wildfire
Wildlife and Insects	Not included in 2009 plan. This hazard is better addressed by other agencies and plans and is not eligible for FEMA mitigation grant programs.

Other hazards not profiled in the plan due to the low likelihood of occurrence or low probability that life and property would be significantly affected are listed in Table 4.4 along with an explanation for this omission.

Table 4.4 Hazards Not Profiled in Plan

Hazard	Explanation for Omission
Erosion/Deposition	The Planning Committee determined that the impacts of erosion and deposition (unrelated to flooding) to structures and people in the County are negligible and are mitigated through existing development policies and practices.
Expansive Soils	Although expansive soils occur in Elbert County, the Planning Committee determined that the impacts to structures and people are negligible and are mitigated through existing development policies and practices.
Extreme Heat	This hazard has not created problems in the past that are unrelated to drought. It is primarily an issue of human and livestock health. Population density is low in Elbert County, and it is rarely hot enough to affect human health.
Land Subsidence	The Planning Committee is not aware of any occurrences or problems associated with this hazard and additional research did not find any previous occurrences.
Volcano	Dotsero, near Glenwood Canyon, is the only volcano of concern in Colorado. It has not erupted in 4,000 years and local mitigation for such an eruption would be difficult.

Table 4.5 lists the hazards profiled in the plan and the jurisdictions impacted by each hazard.

Table 4.5 Hazards Identified for Each Participating Jurisdiction

Hazard	Elbert County	Elizabeth	Kiowa	Simla	Elizabeth FPD	Kiowa FPD	Rattle-snake FPD	Kiowa Conser-vation District
Dam and Levee Failure	✓		✓					✓
Drought	✓	✓	✓	✓	✓	✓	✓	✓
Earthquake	✓	✓	✓	✓	✓	✓	✓	
Flood	✓	✓	✓	✓	✓	✓	✓	✓
Severe Weather	✓	✓	✓	✓	✓	✓	✓	
Tornado	✓	✓	✓	✓	✓	✓	✓	
Wildfire	✓	✓	✓	✓	✓	✓	✓	
Winter Storm	✓	✓	✓	✓	✓	✓	✓	

Note: FPD=Fire Protection District

4.2 Hazard Profiles and Vulnerability

Each of the hazards identified in Section 4.1 Hazard Identification are profiled in this section. Section 4.2.1 Methodology describes each of the elements addressed in each hazard profile. The section concludes with a summary of the overall risk rating for each identified hazard for each participating jurisdiction.

4.2.1 Methodology

The 2009 plan update describes new occurrences of hazard events since the previously approved plan and incorporates new hazard data and information. The sources used to collect information for these profiles include the following:

- Northeast Colorado Emergency Managers' Association Hazard Mitigation Plan (2003)
- State of Colorado Natural Hazards Mitigation Plan (2007)
- Information on past hazard events from the Spatial Hazard Event and Loss Database (SHELDUS), a component of the University of South Carolina Hazards Research Lab, that compiles county-level hazard data for 18 natural hazard event types
- Information on past extreme weather and climate events from the National Oceanic and Atmospheric Administration's National Climatic Data Center (NCDC)
- Disaster declaration history from FEMA, the Public Entity Risk Institute, and the U.S. Department of Agriculture (USDA) Farm Service Agency
- Geographic information systems (GIS) data from Elbert County
- Statewide GIS datasets compiled by state and federal agencies
- Existing plans and reports
- Meetings and data collected from the Planning Committee

Detailed profiles and vulnerability assessments include the following characteristics of each identified hazard:

Hazard Description

This section provides a general description of the hazard and considers the multiple aspects of each identified hazard.

Geographic Location

This section describes the geographic extent or location of the hazard in the planning area and determines which participating jurisdictions are affected by each hazard.

Previous Occurrences

This section includes information on the known historic incidents and includes information related to the impact of those events, if known.

Probability of Future Occurrence

The frequency of past events is used to estimate the likelihood of future occurrences. The probability, or chance of occurrence, was calculated where possible based on existing data. Dividing the number of events observed by the number of years and multiplying by 100 determined the probability. This gives the percent chance of the event happening in any given

year. For example, three droughts occurring over a 30-year period suggests a 10 percent chance of a drought occurring in any given year.

Based on historical data, the probability of future occurrences is categorized as follows:

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

Magnitude/Severity

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

Magnitude and severity is categorized as follows:

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

Vulnerability Assessment

This section describes the County's overall vulnerability to each hazard; identifies existing and future structures, critical facilities, and infrastructure in identified hazard areas; and estimates potential losses to vulnerable structures, where data is available.

Data Limitations

This section makes note of where the Planning Committee encountered data limitations when completing the hazard profile.

4.2.2 Dam and Levee Failure

Hazard Description

Dams are manmade structures built for a variety of uses, including flood protection, power, agriculture, water supply, and recreation. Dams typically are constructed of earth, rock, concrete, or mine tailings. Two factors that influence the potential severity of a full or partial dam failure are the amount of water impounded and the density, type, and value of development and infrastructure located downstream. Dam failures can result from any one or a combination of the following causes, including prolonged periods of rainfall and flooding, improper design or maintenance, negligent operation, or internal erosion caused by embankment or foundation leakage, piping, or rodent activity.

Dams are classified based on the potential loss of life and property to the downstream area resulting from failure of the dam or facilities, not from the condition or probability of the dam failing:

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

Levees are usually earthen embankments designed to contain, control, or divert the flow of water to provide some level of protection from flooding. Some levee systems were built for agricultural purposes and provide flood protection and flood loss reduction for farm fields and other land used for agricultural purposes. Urban levee systems were built to provide flood protection and flood loss reduction for population centers and the industrial, commercial, and residential facilities within them.

Levees are designed to provide a specific level of flood protection. Agricultural levee systems provide a level of protection that is appropriate based on the value of the assets being protected. Urban levee systems, because they are designed to protect urban areas, have typically been built to higher standards. No levee system provides full protection from all flooding events to the people and structures located behind it. Some level of flood risk exists in these levee-impacted areas (FEMA 2009).

Geographic Location

Most dams in Elbert County are constructed of earth and operated by conservation districts for flood control and irrigation. The National Inventory of Dams lists 110 dams in Elbert County. All are classified as low hazard; there are no high or significant hazard dams in Elbert County.

Elbert County is the only jurisdiction participating in the plan affected by dam failures, as they occur in unincorporated areas. The following map shows the location of dams mapped by the National Inventory of Dams. The majority of these occur in the Kiowa Creek drainage south of the Town of Kiowa. Most of these dams were constructed in the 1950s for agricultural purposes.

The only known levee in Elbert County is located along Kiowa Creek to provide flood protection to the Town of Kiowa. The age, owner, and condition of the levee are unknown; neither the Town of Kiowa nor the Colorado Water Conservation Board have been able to locate any record of the levee's design and construction.

Previous Occurrences

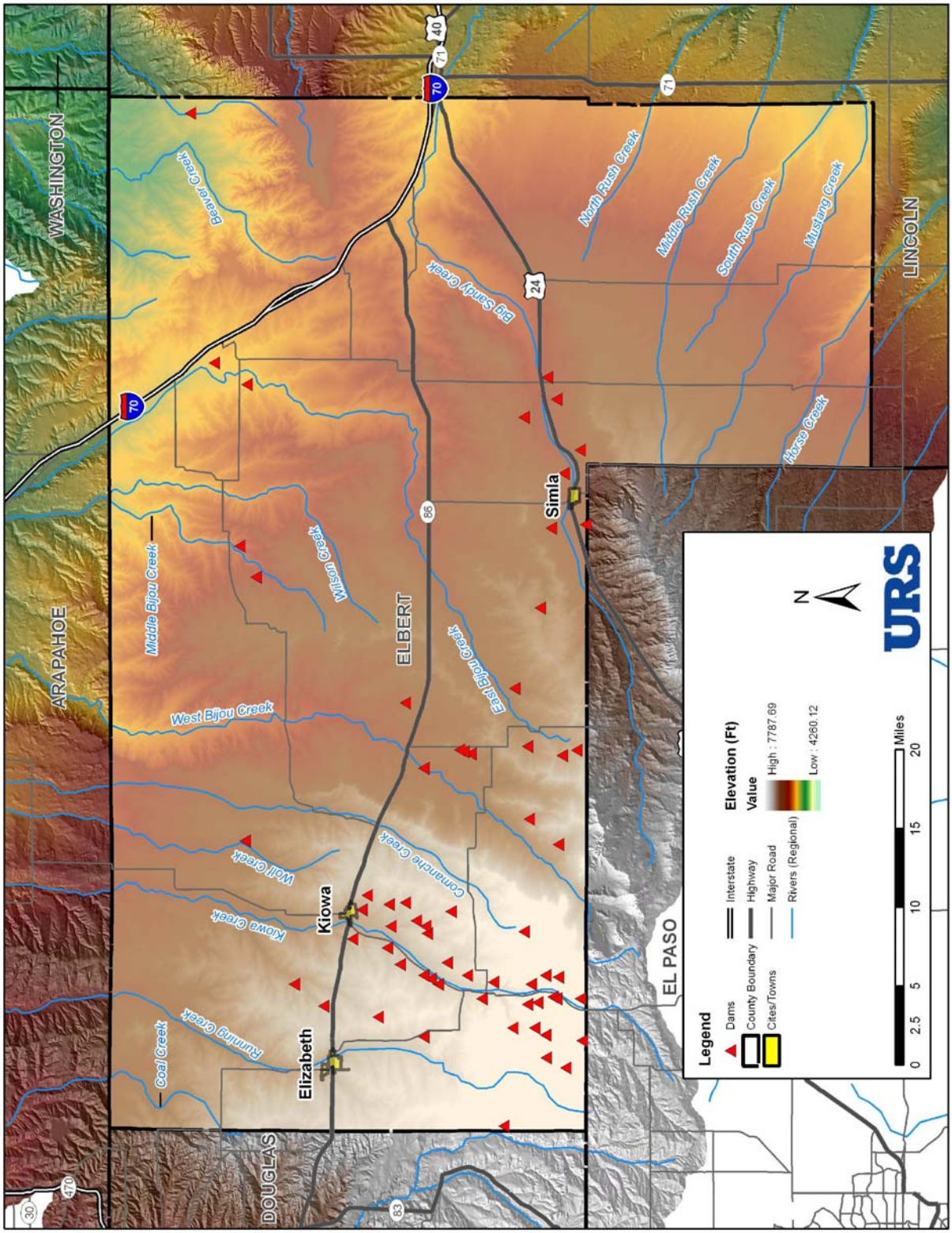
There are no known previous occurrences of dam or levee failure in Elbert County.

Probability of Future Occurrence

Unlikely: *History of events is less than or equal to 10 percent likely per year.*

Calculating probability based on past occurrences does not necessarily reflect the actual risk of future occurrence for dam and levee failure. Further information on this risk is unknown. The Planning Committee reported that the conditions of most small dams in the County are unknown. Local conservation districts do not have adequate funding to monitor and maintain dams and many may be in need of repair, which increases the probability of failure during heavy precipitation or high flows.

Figure 4.1 Dam Locations in Elbert County



Source: National Inventory of Dams

Magnitude/Severity

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

The low hazard classification of dams in Elbert County indicates that loss of life or property due to dam failure is unlikely and would not be critical. Failure could cause flooding of agricultural lands and damage to roads and bridges. However, levee failure could result in flooding in downtown Kiowa and causing damage to structures and infrastructure. A design record or owner of the levee is unknown. The levee is not maintained and its integrity and ability to protect downtown Kiowa in a large flood event is unknown.

Vulnerability Analysis

Overview

All dams in Elbert County are low hazard and present small risk to people and property. However, loss of life is always possible from a dam failure event, as warning time can be fairly short. One major concern of the Planning Committee is a levee providing protection to the town of Kiowa on Kiowa Creek. The age, owner, and condition of the levee is unknown; neither the Town nor the Colorado Water Conservation Board have been able to locate any record of the design and construction. The levee is not maintained and its integrity and ability to protect downtown Kiowa in a large flood event is unknown. New DFIRMs will not show the levee.

Identifying Structures and Estimating Potential Losses

The low hazard ranking indicates that existing structures are not expected to be at risk from dam failure flooding. Failure could cause flooding of agricultural lands and roads and bridges. Roadways may become impassible. No other critical facilities or infrastructure are located within the dam failure inundation areas. Information is not available at this time to estimate potential losses to roads and bridges.

Future Development

Any additional development downstream of dams could elevate their hazard ranking and the level of risk.

Data Limitations

There are no dam failure inundation zone maps for Elbert County. In addition, digital geographic locations do not exist for about half of the dams in the County. The conditions of some dam structures are not known.

4.2.3 Drought

Hazard Description

Drought is a shortage of water associated with a deficiency of precipitation, and occurs when a normal amount of moisture is unavailable to satisfy an area's usual water consumption. Drought can be defined regionally based on its effects in the following categories:

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

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or wildfires, 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.

Geographic Location

Drought is a regional phenomenon and affects all areas of the County and participating jurisdictions with similar frequency and severity. The U.S. Drought Monitor provides online maps of the current drought status nationwide, updated weekly.

Previous Occurrences

According to the 2004 Drought and Water Supply Assessment, by the Colorado Water Conservation Board, Colorado has experienced multiple severe droughts. Table 4.6 lists the significant droughts that have affected Elbert County since the 1880s.

Table 4.6 Significant Drought Periods Affecting Elbert County

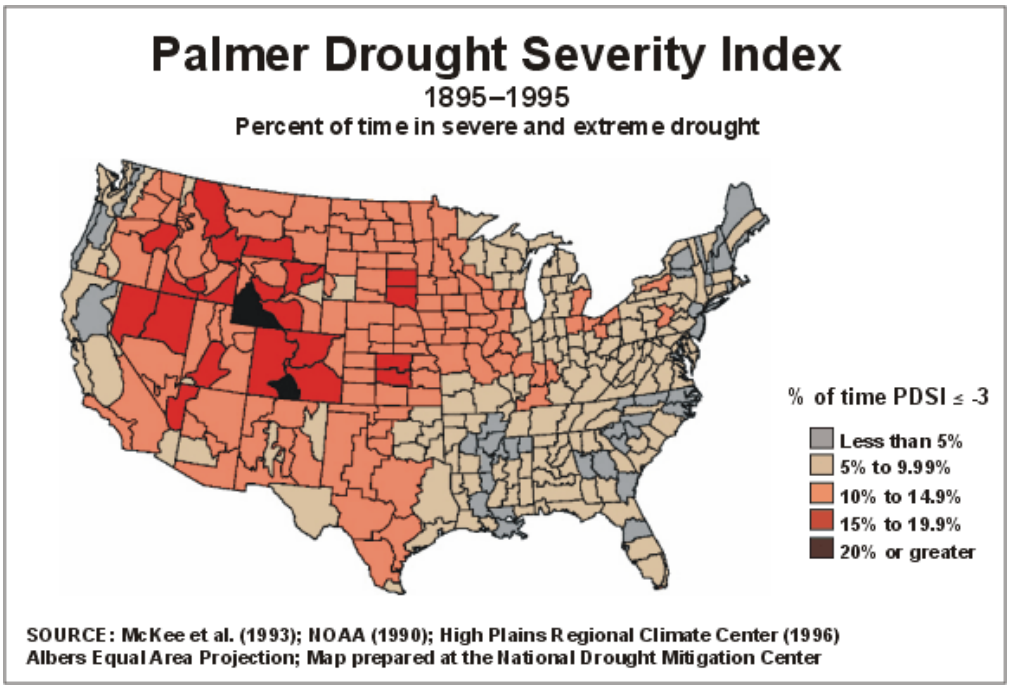
Years	Location/Description	Cost	Data Source
1890–1894	Severe drought east of mountains		CWCB
1930–1940	Widespread, severe, and long lasting drought in Colorado		

Years	Location/Description	Cost	Data Source
1950–1956	Statewide, worse than the 1930s in the Front Range	$40 million in federal aid made available for 13 drought stricken states and used to defer cost of transporting hay.	
1976-1977	Statewide, driest winter in recorded history for Colorado's high country and Western Slope.	Colorado agricultural producers and municipalities received over $110 million in federal drought disaster aid.	
2000-2003	Significant multi-year statewide drought, with many areas experiencing most severe conditions in Colorado in instrumented history. 2002 was the driest year on record for the Denver region and much of the state. For the first time in state history, the Colorado governor asked the federal government to declare all of Colorado a drought disaster area. In 2003, the USDA designated six counties in eastern Colorado, including Elbert, as disaster areas due to drought	Estimated 1.1 billion in losses to Colorado's agricultural, tourism, and recreational industries.	CWCB
2006	USDA designated 59 of 64 counties as disaster areas due to ongoing drought winds, insect pests, and a late freeze.		
2008	In September, the USDA declared 22 counties, including Elbert County, in Colorado a natural disaster area due to drought since January 1, 2008.		

Source: Colorado Water Conservation Board (CWCB) Drought and Water Supply Assessment, 2004, http://cwcb.state.co.us/Conservation/Drought/Drought_Water/index_DWSA.html; National Drought Mitigation Center Drought Impact Reporter, http://droughtreporter.unl.edu/.

Figure 4.2 shows that Elbert County is located in an area of Colorado that experienced drought 15-20 percent of the time over the 100-year period from 1895-1995.

Figure 4.2 United States Percent of Time in Drought, 1895–1995



Probability of Future Occurrences

Likely: *10-100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less*

According to the Palmer Drought Severity Index 1895-1995, Elbert County experienced severe and extreme drought 15-20 percent of the time during that 100-year period. The 2007 Colorado State Emergency Operations Plan estimates hazard probabilities by All-Hazards Emergency Management Regions and assigns a low probability for drought in the North Central Region, where Elbert County is located.

Magnitude/Severity

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

Periods of drought are normal occurrences in Colorado and can cause significant economic and environmental impacts. The severity of drought depends on the degree of moisture deficiency, duration, and size of the affected area. Elbert County has experienced severe to extreme droughts in the past. Climate change is likely to increase the magnitude and severity of drought in Elbert County in the future.

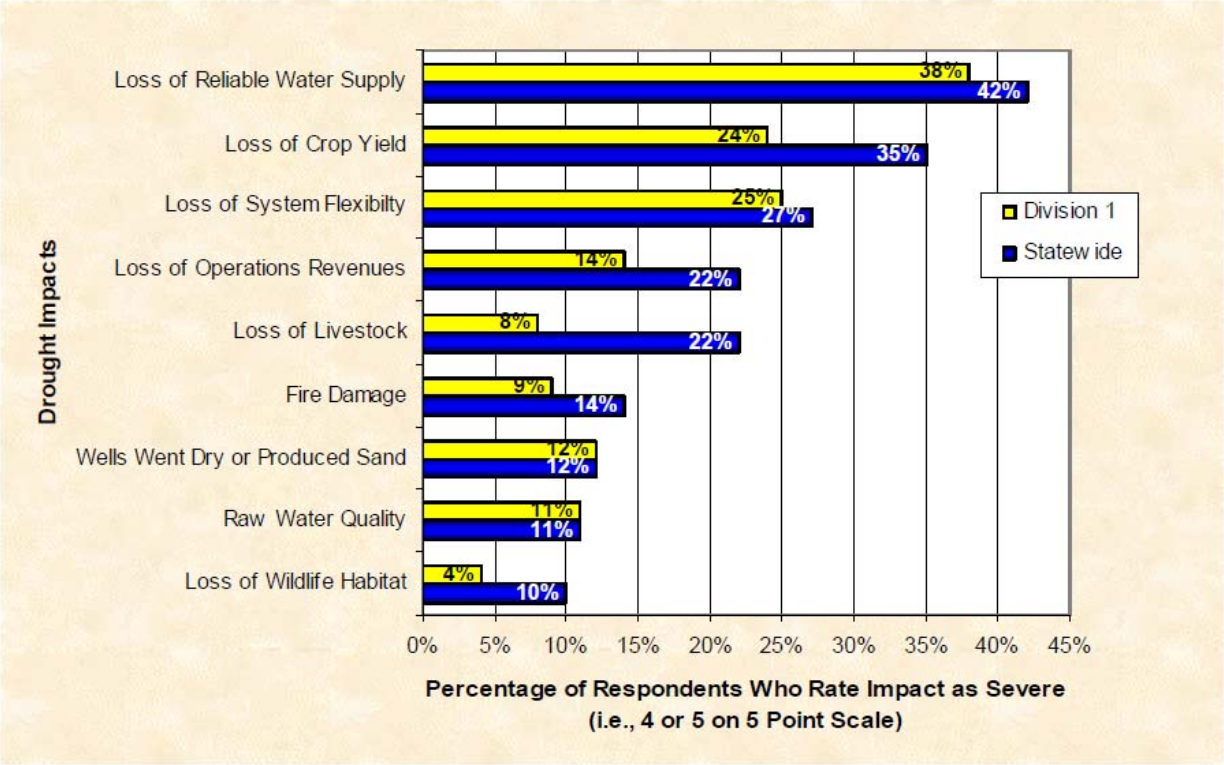
Vulnerability Assessment

Overview

The most significant impacts from drought are related to water-intensive activities, such as agriculture (both crops and livestock), wildfire protection, municipal usage, commerce, recreation, and wildlife preservation, as well as a reduction of electric power generation and water quality deterioration. Secondary impacts of drought are wildfires, wind erosion, and soil compaction that can make an area more susceptible to flooding. Drought impacts increase with the length of a drought.

In the 2004 Drought and Water Supply Assessment for the South Platte Basin (Division 1), where Elbert County is located, water users rated the severity of impacts from the recent 1999-2003 drought. The results shown in Figure 4.3 indicate that the loss of reliable water supply was the impact ranked as most severe in the South Platte Basin.

Figure 4.3 1999-2003 Drought Impacts in South Platte Basin



Source: Colorado Drought and Water Supply Assessment, 2004.

The National Drought Mitigation Center developed the Drought Impact Reporter in response to the need for a national drought impact database for the United States. Information comes from a variety of sources: online drought-related news stories and scientific publications, members of the public who visit the website and submit a drought-related impact for their region, and

government agencies. The Drought Impact Reporter contains information on 110 drought impacts from droughts that affected Elbert County between 1953 and 2009. The highest number of impacts in Elbert County was related to agriculture, followed by the wildfire and social categories. Social impacts are those associated with the public or the recreation/tourism, such as health-related low-flow problems; loss of human life (e.g., from heat stress, suicides); increased respiratory ailments; loss of aesthetic values; and the reduction or modification of recreational activities.

The unincorporated County is most vulnerable to drought impacts related to agriculture and wells. Incorporated towns in Elbert County are most vulnerable to losses related to water supply reliability, operations revenue, and system flexibility. The fire protection districts are vulnerable to impacts related to increased wildfire risk and water supply for wildfire protection.

Identifying Structures and Estimating Potential Losses

Drought normally does not impact structures. Although water and sewer infrastructure may be affected by drought, other critical facilities are generally not. Data is not available to estimate potential losses to structures in identified hazard areas.

The greatest risk to people from drought is the drinking water supply through water systems or individual wells. Most of the unincorporated areas of the County have individual wells.

Future Development

As the population grows, so do the water needs for household, commercial, industrial, recreational, and agricultural uses. Vulnerability to drought will increase with these growing demands on existing water supplies. Future water use planning in Colorado is complex and has to account for increasing population size as well as the potential impacts of climate change. Population centers of the County and agricultural industries are most likely to experience hardships associated with reduced water supply.

Data Limitations

Most data on drought is available for the state or the South Platte Basin. There is little information on past damages and losses specific to Elbert County. In addition, losses are difficult to assess due to the inability to determine the exact beginning and ending of a drought period.

4.2.4 Earthquake

Hazard Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed as a Richter magnitude and

is measured directly from the earthquake as recorded on seismographs. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking, typically the greatest cause of losses to structures during earthquakes, at any given location on the surface as felt by humans and defined in the Modified Mercalli Intensity Scale.

According to the Colorado Geological Survey, Colorado is comprised of areas with low to moderate potential for damaging earthquakes. There are about 90 potentially active faults that have been identified in Colorado, with documented movement within the last 1.6 million years. However, there are several thousand other faults that have been mapped in Colorado that are believed to have little or no potential for producing future earthquakes.

Geographic Location

There are no known faults in Elbert County, so risk is not known to vary across the County and all jurisdictions have a similar risk to earthquake hazards.

Previous Occurrences

The only known previous occurrence is a magnitude 3.0-3.9 earthquake south of Elizabeth that occurred between 1962-1993 (from the 2003 plan).

Probability of Future Occurrences

***Unlikely**: Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years*

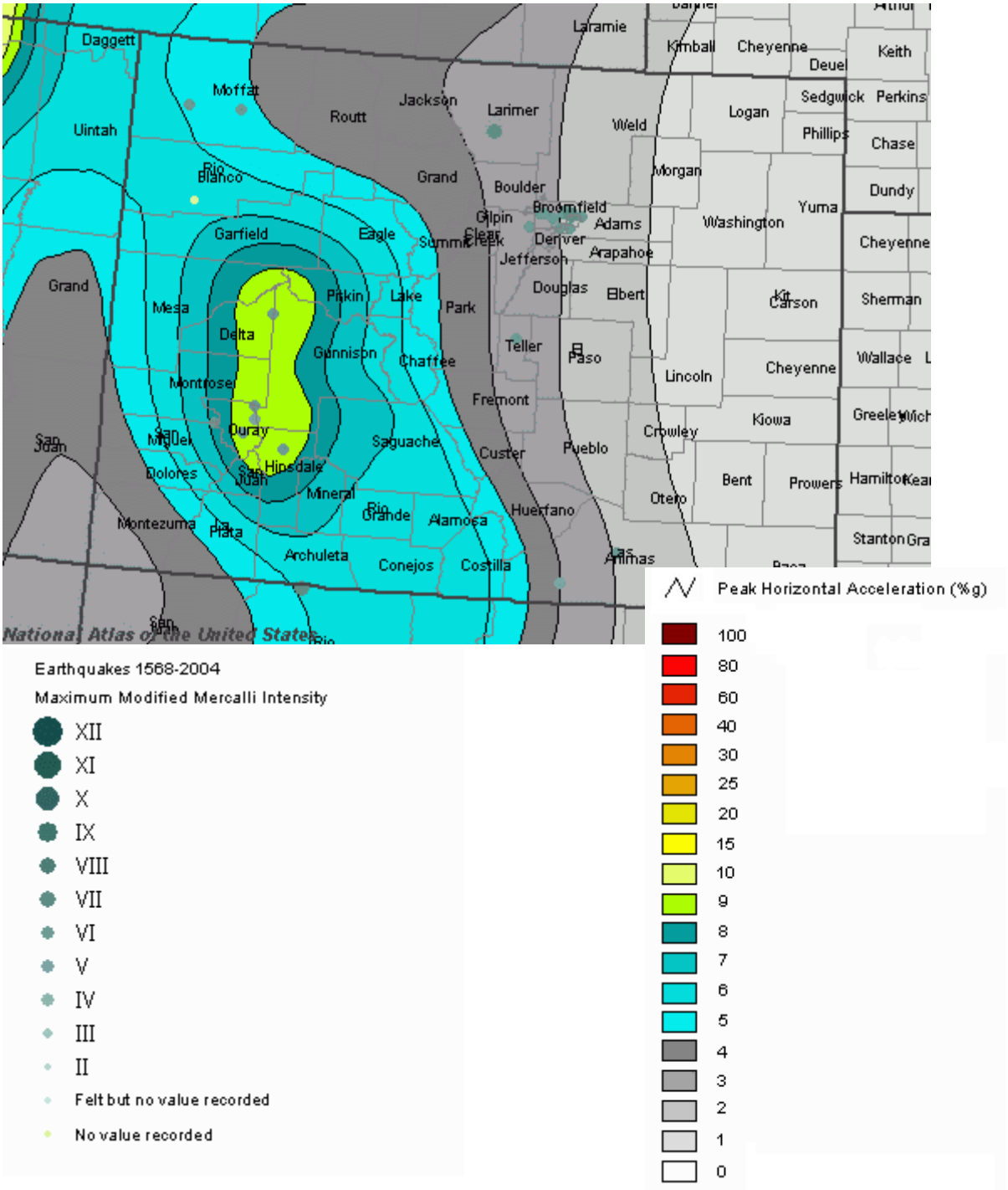
There have been no past damaging events. The occurrence of earthquakes is relatively infrequent in Colorado, and the historical earthquake record is short (only about 130 years). However, the earthquake hazard in Colorado is thought to be not well understood and the potential for unknown active faults exists.

Magnitude/Severity

***Negligible**: No or few injuries or illnesses; minor quality of life loss; little or no property damage; and/or brief interruption of essential facilities and services*

As shown in Figure 4.4, in Elbert County, the shaking level with a 10 percent chance of being exceeded over a period of 50 years is in the range of 1 to 2 percent peak acceleration. Significant earthquake damage typically does not occur until peak accelerations are greater than 30 percent. Secondary impacts of earthquakes may include landslides, seiches, liquefaction, fires, and dam failure.

Figure 4.4 Colorado Seismic Hazard Map—10% Probability of Exceedance in 50 Years



Source: U.S. Geological Survey, www.nationalatlas.gov

Vulnerability Assessment

Overall vulnerability to earthquake hazards is low for all participating jurisdictions due to the low probability and magnitude and the low density of population and structures.

Identifying Structures and Estimating Potential Losses

All structures in Elbert County are potentially vulnerable to seismic ground shaking. The most vulnerable are historic buildings constructed of unreinforced masonry. Historic buildings in Elbert County, such as the Elbert County government center in downtown Kiowa, may be damaged in a seismic event. An inventory of unreinforced masonry buildings in Elbert County does not exist. Other critical facilities or infrastructure at risk are unknown; their construction determines their ability to withstand seismic shaking.

The Colorado Geological Survey (CGS) ran a series of deterministic scenarios for selected Colorado faults using HAZUS-MH to assess potential economic and social losses due to earthquake activity in Colorado. The earthquake magnitudes used for each fault were the "maximum credible earthquake" as determined by the U.S. Geological Survey. There are no known faults in Elbert County. The closest faults analyzed for Elbert County were Cheraw, Rampart, and Ute Pass located in Kiowa, El Paso, and Teller counties, respectively. Table 4.7 summarizes the results for estimated potential losses for Elbert County. The loss ratio is the percentage of the total building stock value damaged. The higher this ratio, the more difficult it is to restore a community to viability (loss ratios of 10 percent or greater are considered critical by FEMA).

The greatest losses to Elbert County would likely result from a magnitude 7.0 earthquake or greater on the Rampart Range fault, which is predicted to cause four fatalities and more than $150 million in economic loss.

Table 4.7 Potential Earthquake Losses in Elbert County by Fault

Fault	Magnitude	Fatalities	Total Economic Loss ($)	Loss Ratio (%)
Cheraw	M7.0	0	7.7 million	-0.3
Rampart	M7.0	4	151.1 million	-6.0
Ute Pass	M7.0	1	69.9 million	-2.8

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

Future Development

All of the participating jurisdictions have adopted building codes, which substantially reduce the potential cost of damages to future structures from earthquakes.

Data Limitations

It is not possible to accurately estimate the timing or location of future dangerous earthquakes in Colorado. The lack of an adequate network of seismometers in Colorado makes it difficult to detect and locate earthquakes. The historical record also is quite short—about 150 years (Colorado Geological Survey, 2009).

4.2.5 Flood

Hazard Description

Elbert County is at risk to riverine and stormwater flooding. Riverine flooding is defined as when a watercourse exceeds its "bank-full" capacity and generally occurs as a result of prolonged rainfall, or rainfall that is combined with soils already saturated from previous rain events. The area adjacent to a river channel is its floodplain. In its common usage, "floodplain" most often refers to that area that is inundated by the 100-year flood, the flood that has a 1 percent chance in any given year of being equaled or exceeded. The 1 percent annual flood is the national standard to which communities regulate their floodplains through the National Flood Insurance Program (NFIP).

Stormwater refers to water that collects on the ground surface or is carried in the stormwater system when it rains. In runoff events where the amount of stormwater is too great for the system, or if the channel system is disrupted by vegetation or other debris that blocks inlets or pipes, excess water remains on the surface. This water may pond in low-lying areas, often in street intersections. Stormwater ponding, also known as localized flooding, may result in deep water and pollution. Stormwater can pick up debris, chemicals, dirt, and other pollutants from impervious surfaces.

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

Geographic Location

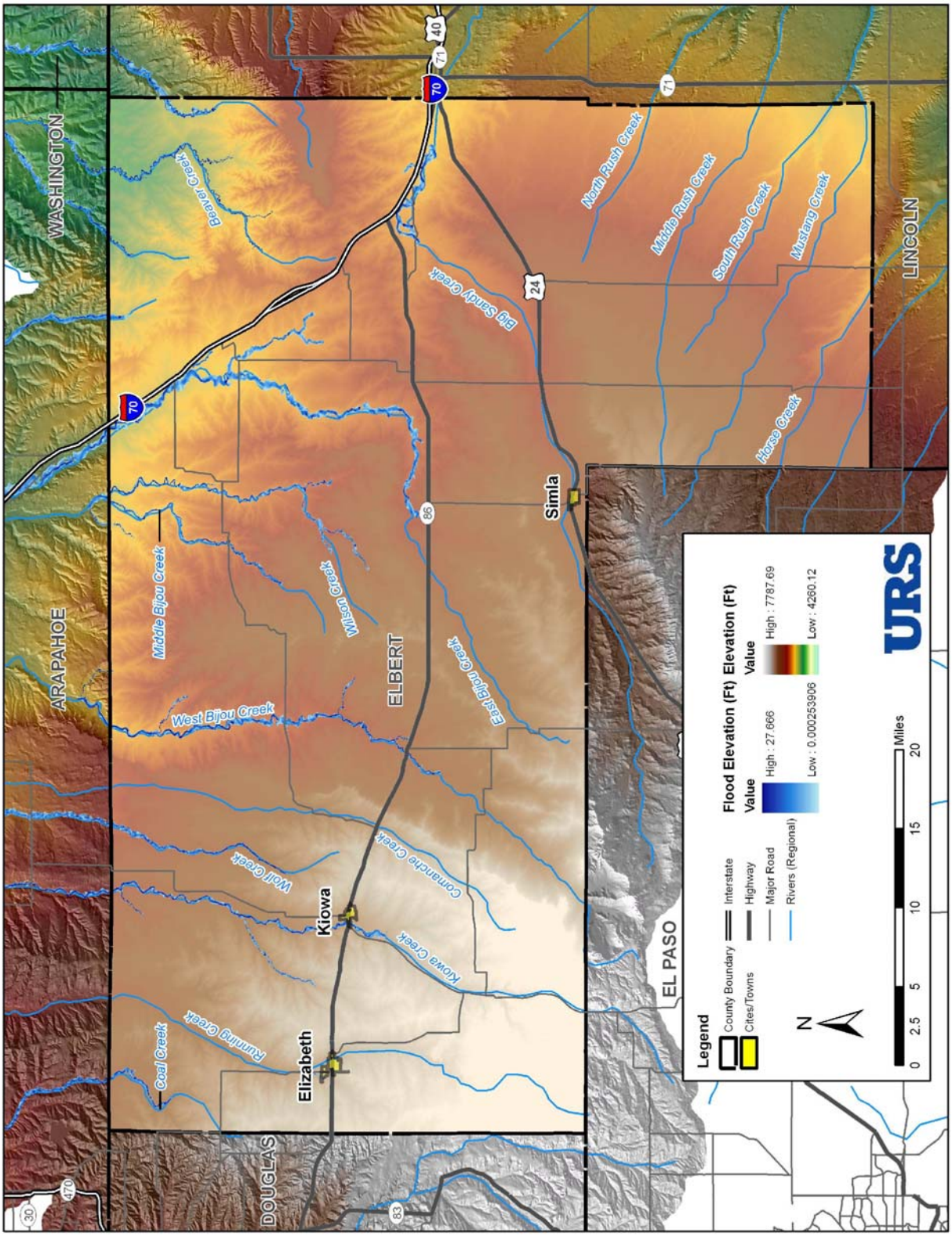
Elbert County is located within the South Platte River drainage basin in east central Colorado. Running Creek in Elizabeth and Kiowa Creek in Kiowa are the greatest sources of flood hazards. Elbert County is subject to flash flooding and slow rise flooding related to Severe Weather events between May and June when snowmelt runoff is flowing.

FEMA has not produced floodplain maps for Elbert County. Digital flood insurance rate maps (DFIRMs) are currently being developed but preliminary maps were not available for this planning project, with the exception of a preliminary DFIRM for the town of Elizabeth. In 2007, the Colorado Water Conservation Board approved a grant to study the 100-year detailed floodplain, which will develop a hydrologic base for further development of floodplain mapping for the critical stream reaches within Elbert County. The streams being studied are as follows:

- Running Creek
- Cabin Gulch
- Gold Creek
- Hay Gulch
- Henderson Gulch
- Timber Claim Gulch
- Whiskey Gulch
- Kiowa Creek
- Dry Creek
- Gopher Creek
- Little Dry Creek
- Neffs Gulch
- West Kiowa Creek
- Comanche Creek
- West Bijou Creek
- Big Gulch
- East Gulch
- Spring Branch
- Spring Gulch
- Station Gulch

The best available data for riverine flooding in Elbert County was generated by HAZUS-MH MR3, FEMA's software program for estimating potential losses from disasters. HAZUS was used to generate a 1 percent annual flood, or 100-year flood, in Elbert County. The software produces a flood polygon and flood-depth grid that represents the 100-year flood. While not as accurate as DFIRMs, these floodplain boundaries are useful for GIS-based loss estimation. Figure 4.5 is a map of the 100-year floodplain for Elbert County and each participating jurisdiction. Floodplain maps for each town are located in the flood vulnerability section.

Figure 4.5 HAZUS 100-Year Floodplain in Elbert County



Source: HAZUS MH MR-3

Previous Occurrences

The most significant flood events occurred in 1935, 1965, 1997, and 1999. The most damaging flood was in 1935, when flooding on Kiowa Creek destroyed three-fourths of the structures location in the Town of Elbert and resulted in nine deaths. Additional small agricultural and flood control dams have been constructed throughout the County since that time, changing flood patterns. Table 4.8 provides best available information on past flood events in Elbert County, compiled from a number of sources as noted below.

Table 4.8 Major Flood Events in Elbert County

Year	Location	Description	Data Source
1878	Kiowa Creek	May 21, 1978. Train engine missing in quick sand of Kiowa Creek.	CWCB
1930	Bijou Creek		CWCB
1935	Kiowa Creek	May 31, 1935. Seven lives lost at Elbert and nine lives lost total. All bridges lost, 59 buildings destroyed, water 8-15 feet deep, and 5 feet of sand. Three-fourths of town of Elbert destroyed and not rebuilt.	CWCB
1940	Bijou Creek		CWCB
1965	Bijou, Running, Kiowa, and Plum creeks	June 15-17, 1965. In the 118 square mile Kiowa Creek basin above the town of Kiowa, the floods were several times the size of the design floods for the project structures. As a result, the floods caused extensive erosion damage. Many acres of crop and pasture land were a total loss from heavy erosion, streambank cutting, or sediment deposition. The three forks of Bijou Creek washed out or damaged bridges on the main line of the Union Pacific Railroad and Interstate-70.	NCDC, NCAR
1973		FEMA-385-DR. Heavy rains, snowmelt, and flooding	PERI
1997	Kiowa, Simla	July 29-30, 1997. FEMA-1186-DR. $399,866. Flooding and flash flooding caused water two feet of water to cover portions of roadway near Kiowa. High waters forced the evacuation of several residents in Simla. Highway 86, between Simla and Limon was closed due to high waters. The flood also closed portion of Interstate 70 west of Limon.	PERI, NCDC, FEMA
1998	Coal Creek	August 21, 1998. Heavy rain caused flash flooding along Coal Creek in northwest Elbert County. Large tree trunks and some boats were reportedly washed downstream. County Road 50 along the Arapahoe/Elbert County line was closed. County Road 186 was also washed out.	Planning Committee
1999		May 1999. FEMA-1276-DR. FEMA Public Assistance=$137,236; State=$21,806; County=$21,806. Damage to gravel roads and culverts.	FEMA, CWCB
1999		August 5, 1999. $772,000; FEMA/State provided $550,000. Primarily road damage.	CDEM

Year	Location	Description	Data Source
2000	Whiskey Gulch, north of Elizabeth, tributary of Running Creek	July 17, 2000. Six inches of rain in about one hour damaged culverts, fences, agricultural lands, and several residential structures. Basement flooding occurred in several homes in West Country Ranches subdivision. Along County Road 13, six miles north of Elizabeth, rushing water washed away a 15-foot section of road. The flood waters forced debris and mud into four huge culverts, sending water onto the road.	Planning Committee, NCDC, CWCB
2001		Mile Road washed out	Planning Committee
2002	East-central Elbert County	September 8, 2002. Flood water washed out two county roads in east central Elbert County. Another roadway, County Road 98 was inundated with two feet of water	NCDC
2003	East-central Elbert County; Sandy Creek	May 15, 2003. Flash flooding was reported either miles south west of Interstate 70, along State Highway 86. Highway 86 was closed due to flooding along the Elbert and Lincoln County lines as Sandy Creek jumped out of its banks.	NCDC
2006	Cedar Point	July 17, 2006. Severe thunderstorms caused flash flooding near exit 354 of Interstate 70. A spotter reported a nearby road inundated under four feet of water.	NCDC
2006	Eastern Elbert County	September 1, 2006. Thunderstorms brought heavy rain and flashing flooding to portions of Elbert County. Flood waters inundated State Highway 24 with two feet of water, nine miles southeast of Agate. County roads 134 and 153, three miles west of Cedar Point and one mile sough of Agate respectively, were inundated with up to two feet of water.	NCDC
2007	Deer Creek Farms Subdivision	Four inches of heavy rain caused moderate damage to one house	Planning Committee

Source: Colorado Water Conservation Board (CWCB), National Climatic Data Center (NCDC), Public Entity Risk Institute (PERI), National Center for Atmospheric Research (NCAR), and Elbert County Hazard Mitigation Planning Committee.

Probability of Future Occurrences

***Likely**: 10-100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less*

Data collected on the past history of flood events indicates that a significant flood event has occurred every 1 to 10 years.

Magnitude/Severity

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

Floods can result in loss of life and property with the extent of the damage dependent on the depth and velocity of floodwaters. Past flood events in Elbert County have damaged roads and bridges, public facilities, private property, businesses, and caused loss of life. These events are likely to continue in the future and may be exacerbated by increasing development. FEMA is currently mapping the 100- and 500-year flood hazards in Elbert County. These flood studies will show the extent and related probability of occurrence for floods on streams with the greatest risk in Elbert County.

Vulnerability Assessment

In Elbert County, structures are located in areas at risk to riverine flooding and flooding related to stormwater drainage. The number and value of structures in the floodplain is highest in unincorporated areas, including the unincorporated Town of Elbert and in residential subdivisions in the western part of the County. Of the incorporated municipalities, the Town of Kiowa has the greatest number and value of structures at risk. The Kiowa schools complex is not located in the mapped 100-year floodplain but is located near a dry drainage prone to flash flooding. The Elbert wastewater treatment plant is located in the Kiowa Creek floodplain but has been elevated to mitigate the risk of flood damage.

The Planning Committee identified the following additional flood problem areas:

- Town of Elbert
- Deer Creek Farms
- Sun County development
- Washington Avenue, Cheyenne Avenue, Sioux Avenue, and along Highway 24 in Simla
- County Road 194: between Northout and Coal Creek Street, .5 miles west of County Road 29, and 1 mile west County Road 129.

National Flood Insurance Program

Elbert County joined the National Flood Insurance Program (NFIP) in 2007. Any structure built in the floodplain now has to meet NFIP requirements. The town of Kiowa joined the NFIP emergency program in 1999, which is the initial phase of a community's participation in the NFIP and is designed to provide a limited amount of insurance at less than actuarial rates. Kiowa has been provided with a Flood Hazard Boundary Map, and the community has adopted floodplain management standards to control future use of its floodplains. Elizabeth is evaluating joining the NFIP when new DFIRMs become effective. The Town currently has floodplain management standards in place. The Town of Simla has adopted a flood hazard prevention ordinance and is in the process of joining the NFIP.

Table 4.9 provides information on the NFIP participation of communities in Elbert County. NFIP insurance data indicates that as of February 25, 2009, there are three flood insurance policies in force ($1,0505,000 in coverage) in the unincorporated areas of the County and three in Kiowa

($600,000 in coverage). There are no recorded insurance claims to date. There are no repetitive loss structures and no communities participate in the NFIP Community Rating System.

Table 4.9 Elbert County NFIP Information

Jurisdiction	Date Joined	Effective FIRM Date	Policies in Force	Insurance in Force ($)	Number of Claims	Claims Total ($)
Elbert County	08/13/07 Regular Program	01/01/50	3	1,050,000	0	0
Elizabeth	Not Participating	12/12/78				
Kiowa	04/26/99 Emergency Program	02/27/76	3	600,000	0	0
Simla	In Process of Adopting					

Source: National Flood Insurance Program BureauNet, http://bsa.nfipstat.com/comm_status/index.htm, 02/25/2009.

Identifying Structures and Estimating Potential Losses

HAZUS-MH was used to identify the structures located in the 100-year floodplain, and thus considered high risk. Building counts and values were taken from HAZUS-MH census block-level data and then aggregated by municipal boundaries. In cases where census block boundaries cross municipal boundaries, the counts were attributed to the city or unincorporated county where the majority of the census block is located.

Table 4.10 Structures Located in 100-Year Floodplain by Jurisdiction

Community	Number of Structures	% of Total Structures	Total Structure Value
Elizabeth	3	0.39%	$220,400
Kiowa	26	8.50%	$302,300
Simla	0	0	0
Unincorporated Areas	479	2.61%	$904,285
Total	**508**	**2.56%**	**$1,426,985**

Source: HAZUS- MH MR3

HAZUS provides reports on the number of buildings impacted, building repair costs, and the associated loss of building contents and business inventory. Building damage can also cause function losses to a community, which relate to the opportunity loss of being able to use a building. Income loss data accounts for business interruption and rental income losses as well as the resources associated with damage repair and job and housing losses. These losses are calculated by HAZUS using a methodology based on the building damage estimates. Flood damage is directly related to the depth of flooding. For example, a two-foot flood results in about

20 percent of the structure being damaged (which translates to 20 percent of the structure's replacement value).

Table 4.11 shows that HAZUS estimates total building damages of over $4 million in Elbert County. In addition, HAZUS estimates that the number of people displaced by the flood event to be 140 and the number of people requiring short-term sheltering to be 27.

Table 4.11 HAZUS 100-Year Flood Building Damage Estimates for Elbert County

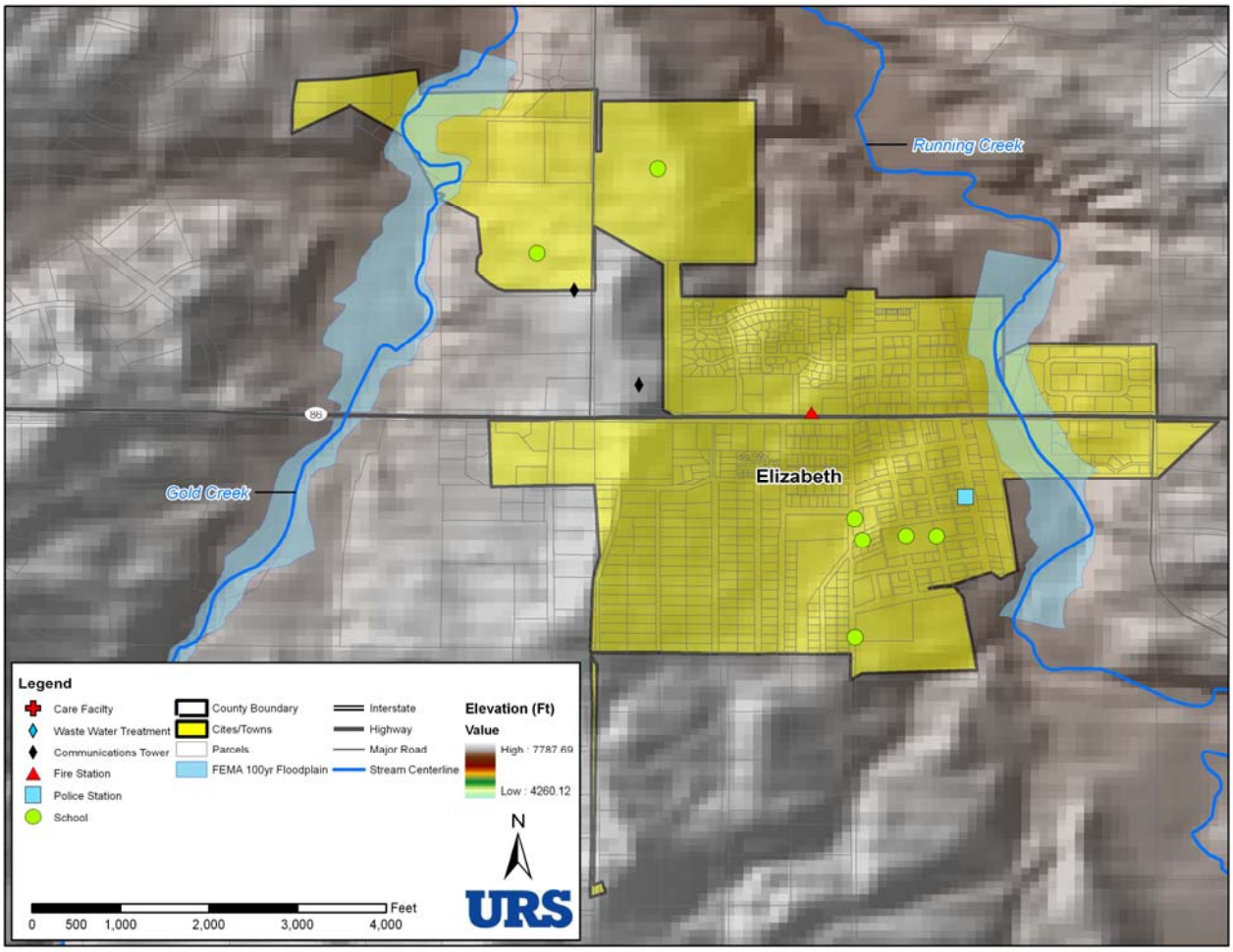
Type	Damage Estimate
Building Damage	$1,930,000
Contents Damage	$2,162,000
Inventory Loss	$62,000
Relocation Loss	$1,000
Wages Losses	$11,000
Capital Related Loss	$4,000
Rental Income Loss	0
Total Loss	$4,170,000
Loss Ratio	.7%

Source: HAZUS-MH MR3, 2009

Critical Facilities and Infrastructure

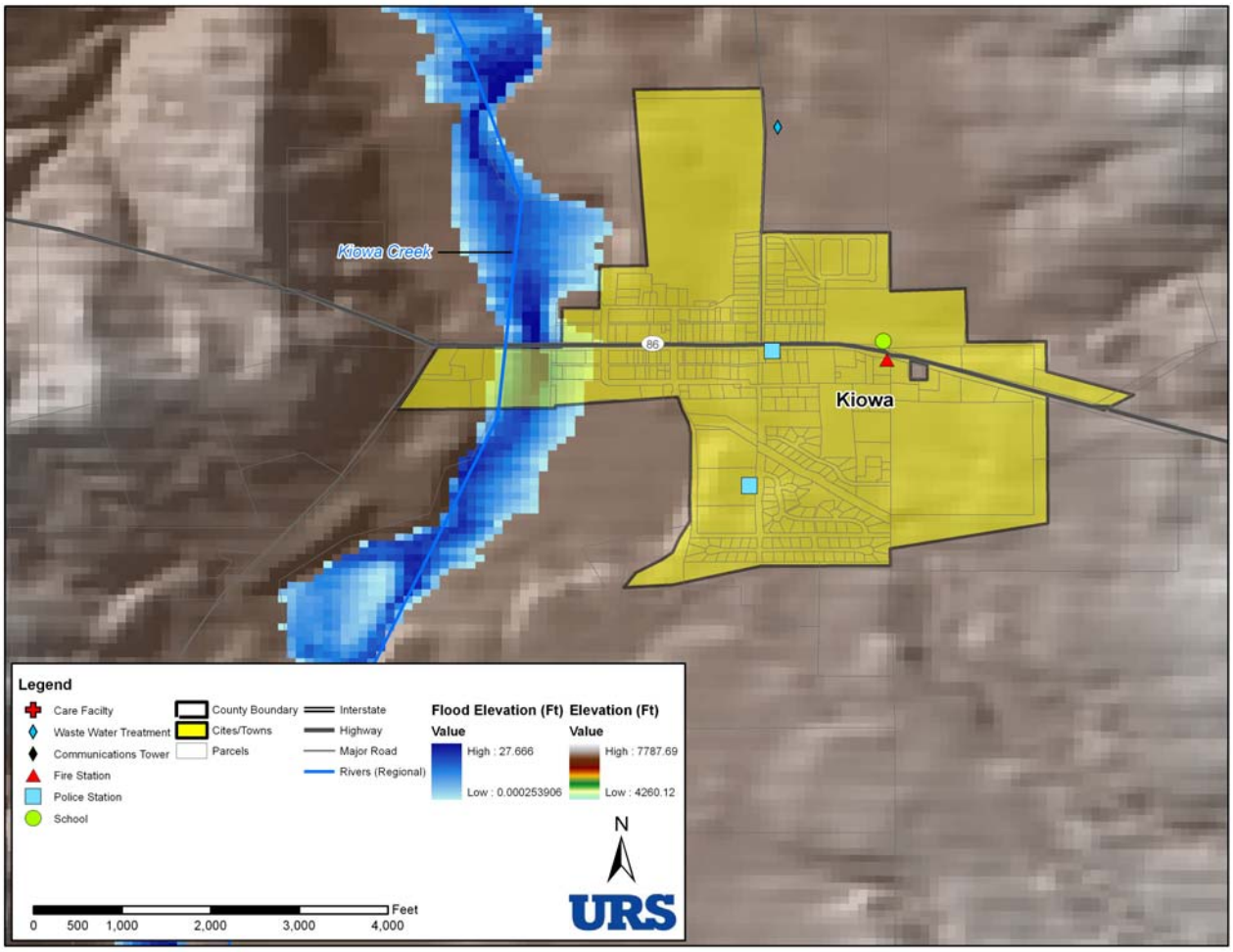
To identify critical facilities located in the floodplain, GIS data from Elbert County showing the locations of critical facilities was combined with the 100-year floodplain map. For the County, Kiowa, and Simla, the HAZUS floodplain map was used. For Elizabeth, the preliminary DFIRM was used. Figures 4.6-4.8 illustrate these results. No critical facilities were identified in the 100-year floodplain. The Elbert wastewater treatment plant is located in the floodplain of Kiowa Creek but has been elevated.

Figure 4.6 Elizabeth Flood Hazards and Critical Facilities



Source: FEMA Preliminary DFIRM (Not Effective), 2009

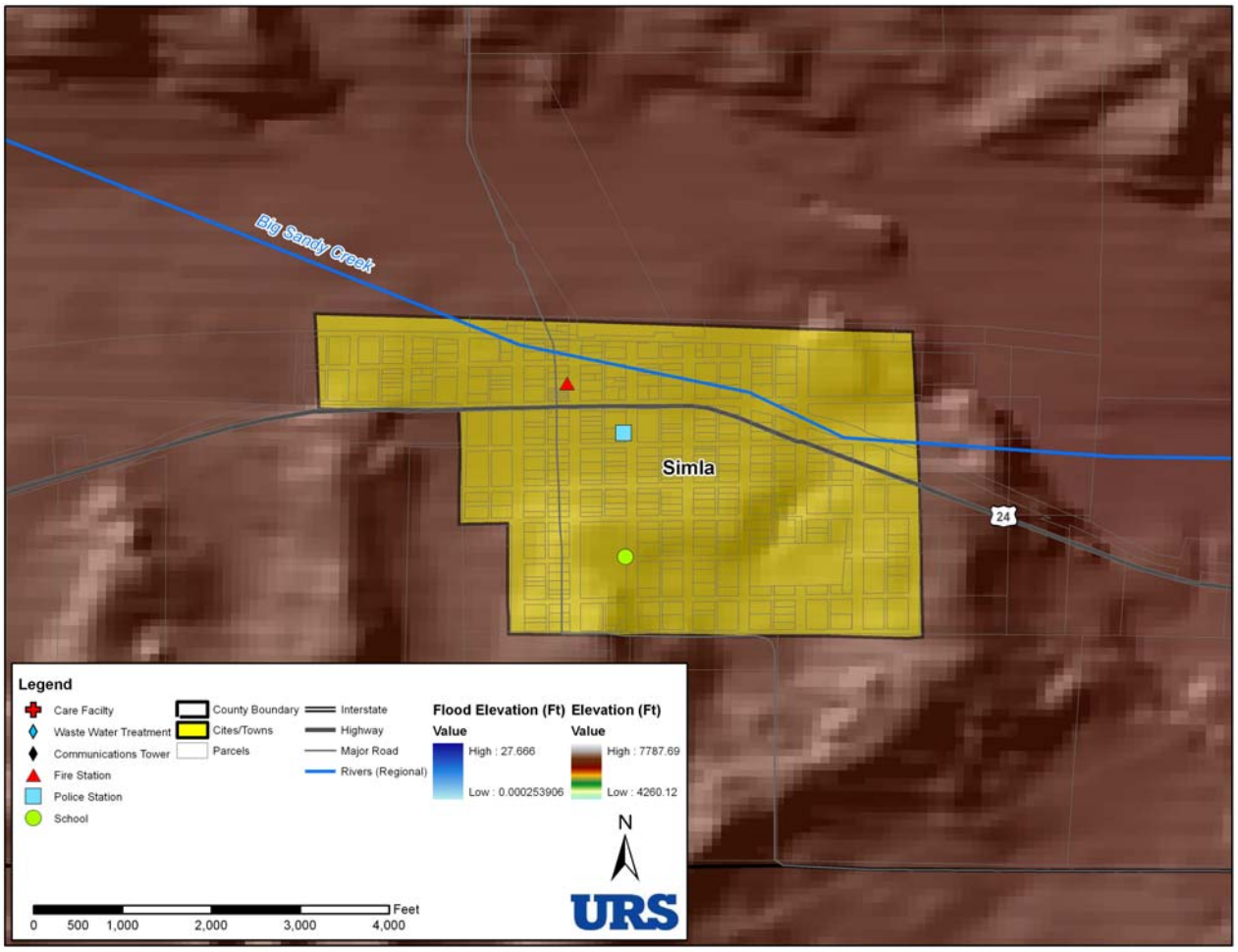
Figure 4.7 Kiowa Flood Hazards and Critical Facilities



Source: HAZUS MH MR-3

The Kiowa School is not located in the 100-year floodplain but is at risk to flooding due to a dry drainage that is subject to flash flooding.

Figure 4.8 Simla Flood Hazards and Critical Facilities



Source: HAZUS MH MR-3

Future Development

The floodplain management programs of Elbert County and the Town of Kiowa, if properly enforced, should minimize the risk of flooding to future development. Risk could be further reduced if the Town of Elizabeth were to join the NFIP and strengthen their existing floodplain ordinances and floodplain management programs beyond the minimum NFIP requirements.

Data Limitations

As discussed previously, Elbert County DFIRMs are currently being developed and preliminary DFIRMS were not available for this planning project, with the exception of the Town of Elizabeth. HAZUS maps were used for this plan. They provide a less accurate estimate of the floodplain than DFIRMs. The County should revise the estimations of structures and values in the floodplain using their Assessor's data and new DFIRMs when they become effective.

4.2.6 Severe Weather

Hazard Description

For the 2009 plan update, the Severe Weather hazard profile includes information on hail, lightning, and windstorms in Elbert County. In the 2003 plan, other wind hazards and hail and severe summer storms were separate hazards.

Hail

Hail is associated with thunderstorms that can also bring high winds and tornadoes. It forms when updrafts carry raindrops into extremely cold areas of the atmosphere where they freeze into ice. Hail falls when it becomes heavy enough to overcome the strength of the updraft and is pulled by gravity towards the earth. Hailstorms cause damage to structures and other types of property, as well as crops and livestock, and in rare cases to humans.

Lightning

Lightning is an electrical discharge between positive and negative regions of a thunderstorm. It is sudden, extremely destructive and potentially deadly. Intracloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually it takes place inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers. Although not as common, cloud-to-ground lightning is the most damaging and dangerous form of lightning. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat. Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage.

Windstorms

Windstorms represent the most common type of Severe Weather. Often accompanying severe thunderstorms (convective windstorms), they can cause significant property and crop damage, threaten public safety and disrupt utilities and communications. Straight-line winds are generally any wind not associated with rotation (i.e., not a tornado) and in rare cases can exceed 100 miles per hour (mph). The National Weather Service defines high winds as sustained wind speeds of 40 mph or greater lasting for one hour or longer, or winds of 58 mph or greater for any duration. Windstorms are often produced by supercell thunderstorms or a line of thunderstorms that typically develop on hot and humid days.

Geographic Location

Hail, lightning, and windstorms can occur anywhere in Elbert County and pose a similar risk to all participating jurisdictions. FEMA's Wind Zones in the United States Map shows Elbert County located in Wind Zone II with winds of up to 160 mph.

Previous Occurrences

Hail

Data from the NCDC and SHELDUS includes142 hail events in Elbert County from 1950-2008, not counting multiple events counted on the same day within the County. Table 4.12 shows the number of hail events organized by the size of the hail. There were 22 occurrences of hail two inches in diameter or larger, during the period measured, which is the magnitude that the National Weather Service considers Severe Weather.

Table 4.12 Hail Events Summarized by Hail Size, 1950-2008

Diameter	Number of Events
2-3 inches	16
3-4 inches	1
>4 inches	5

Source: National Climatic Data Center (NCDC) and SHELDUS

The Planning Committee and NCDC also provided the following information on past damages:

- August 1993: Hail damage estimated at $5,000
- June 1997: Hail/heavy rain event in southern Elbert County produced golf-ball sized hail, destroyed 18,000 acres of wheat crop, and washed out County Roads 185 and 197.
- June 2007: Baseball-sized hail affected the Town of Elbert and resulted in many insurance claims

Lightning

Table 4.13 lists reported lightning damage from NCDC and SHELDUS during the period from 1960-2008. It should be noted that this database captures only a small portion of damaging lightning events; most go unreported. No additional information on the cost of property damage is known.

Table 4.13 Reported Lightning Damages in Elbert County, 1960-2008

Year	Location	Description	Data Source
1988		June 21, 1988. One fatality	SHELDUS
1997	10 miles south-southwest of Agate	June 18, 1997. Lightning struck an oil storage facility causing two tanks to explode into flames. A truck driver received minor injuries when he was knocked off a ladder from the explosion	NCDC
2001	10 miles south of Kiowa	July 11, 2001. A 13-year old boy scout was knocked unconscious when a lightning struck a tree near his tent.	NCDC

Source: National Climatic Data Center (NCDC) and SHELDUS

Windstorms

Data from NCDC and SHELDUS was combined to determine that there were roughly 89 recorded wind events affecting Elbert County from 1950-2008. These wind events were reported as wind only or thunderstorm wind events. The summary does not include winds that were part of winter storms (see Section 4.2.9 Winter Storm). Table 4.14 lists events with notable damage descriptions or injuries.

Table 4.14 Reported Windstorm Damages in Elbert County, 1950-2008

Year	Location	Description	Cost
1994	Elizabeth	May 7, 1994. Thunderstorm winds gusting to 70 miles per hour and blew out windows and damaged a storm door of a home in Elizabeth.	$500
1994	Kiowa	June 12, 1994. Thunderstorm winds blew two metal sheds 300 yards near Kiowa. Several power poles snapped in two.	$5,000
1996	Northeast Colorado	October 29, 1996. $5.2 million in damages in northeast Colorado. One man was killed when a strong wind gust overturned a popup camper on him as he tried to secure it. Several trees and power lines were downed.	
1997	Matheson	July 27, 1997. One injury at Matheson	
1999	Northeast Colorado	April 8-9, 1999. Windstorms caused $13.8 million in damages across northeast Colorado. Damages were mostly broken fences, doors, and windows and crop damages. Multiple accidents occurred when tractor trailer rigs were blown on their sides. Blowing dust and dirt caused near zero visibilities closing sections of Interstate 25 and 76. Downed trees and power lines caused power outages and sparked a few grass fires.	

Year	Location	Description	Cost
2001	Northeast Colorado	May 20, 2001. Intense winds downed trees and power lines and caused zero visibilities due to blowing dust, dirt, and debris. Several vehicles were blown off Interstate 70 west of Limon and Interstate 76.	
2002	Northeast Colorado	May 21, 2002. Very strong winds over northeast Colorado caused blowing dust and dirt reducing visibilities to less than a quarter of a mile. Damages to roofs, trees, and power lines were reported at several locations.	

Source: National Climatic Data Center and SHELDUS

Probability of Future Occurrences

***Highly Likely**: Near 100 percent chance of occurrence next year or happens every year*

According to the record, as described above, hail, lightning, and windstorms occur every year in Elbert County.

Hail

Data from the NCDC and SHELDUS was combined to identify 22 Severe Weather events with hail of two inches or greater in a 58 year period. This averages to one severe hail event every 2.6 years or a 38 percent chance in any given year.

NOAA's National Severe Storms Laboratory completed a project to estimate the likelihood of Severe Weather hazards in the United States. Between 1908 and 1999, in the area where Elbert County is located, there were .75-1.25 days per year with hail of 2-inch diameter or larger and 3-4 days per year with hail of ¾-inch diameter or larger. Probability for hail events is highest in June, when there is a 4 percent probability for hail storms of ¾-inch or larger on any given day.

Lightning

NCDC and SHELDUS record three damaging lightning events in 48 years, which averages to one every 16 years, or a 6.3 percent chance in any given year. However, most damaging events go unreported.

Windstorm

NOAA's National Severe Storms Laboratory estimates that between 1909-1999 in the area where Elbert County is located, there were 1-2 days per year with wind events of 50 knots or greater and .25-.5 days per year with wind events of 65 knots or greater. Probability for windstorms is highest in July and August, when there is a 1.5 percent chance of wind over 58 knots on any given day.

Magnitude/Severity

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

Hail

Hailstorms cause damage to property, crops, and the environment and kill and injure livestock. Vehicles, roofs of buildings, and landscaping are commonly damaged by hail. Hail also can cause injury to humans, occasionally fatal. In addition to hail diameter, number and density of hailstones, hail fall speed, and surface wind speeds affect severity.

Table 4.15 from the Tornado and Storm Research Organization describes typical damage impacts of the various sizes of hail.

Table 4.15 Hailstorm Intensity Scale

Intensity Category	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	0.2-0.4	Pea	No damage
Potentially Damaging	0.4-0.6	Mothball	Slight general damage to plants, crops
Significant	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
Severe	1.2-1.6	Pigeon's egg > squash ball	Widespread glass damage, vehicle bodywork damage
Destructive	1.6-2.0	Golf ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
Destructive	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	2.4-3.0	Tennis ball > cricket ball	Severe roof damage, risk of serious injuries
Destructive	3.0-3.5	Large orange > Soft ball	Severe damage to aircraft bodywork
Super Hailstorms	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
Super Hailstorms	4.0+	Melon	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: Tornado and Storm Research Organisation (TORRO), Department of Geography, Oxford Brookes University

Lightning

Although the frequency of lightning events is high, the magnitude is limited. Generally damages are limited to single buildings and in most cases, personal hazard insurance covers any losses. Lightning can cause deaths, injuries, and property damage, including damage to buildings, communications systems, power lines, and electrical systems. It also causes forest and brush fires. In an average year in Colorado, 3 people are killed and 13 are injured.

Windstorms

Windstorms in Elbert County are rarely life threatening, but do disrupt daily activities and cause damage to buildings. Impacts of strong, straight line winds can be erosion, dryland farming seed loss, wind blown weeds, and building damage, primarily to roofs.

Vulnerability Assessment

Overview

In Elbert County, hail primarily causes crop damage. In populated areas, it can cause significant damage to roofs, automobiles, and windows. Hail also can block culverts and drainage structures causing flooding. Lightning has the potential to injure/kill people and damage structures. Communications systems are also at risk. Windstorms primarily damage structures, trees, utilities, and crops.

Identifying Structures and Estimating Potential Losses

Hail, lightning, and windstorms affect the entire planning area, including all above-ground structures and utilities. Structure damage due to hail is usually covered under private insurance. Personal injury can also occur as a result of very large hail if individuals are outdoors during a hail event.

In general, the height, rigidity, and surface area/weight ratio of objects are the primary indicators of their susceptibility to damage from windstorms. Trees, barns, mobile homes, high-profile vehicles, and power lines are at specific risk from either direct or indirect wind impacts. Roofs, windows, and wall assemblies of residential homes can be severely damaged as wind speeds increase. The design wind speed is 90 miles per hour for Elbert County.

All above-ground buildings, infrastructure, and critical facilities are at risk to damage and destruction by Severe Weather as there are no specific identified hazard areas. The following estimate is provided assuming a complete loss of a majority of structures throughout the county due to a severe weather: $171,530,400. This value represents improved structure value including contents and is derived using HAZUS-MH.

Future Development

Future residential or commercial buildings built to code should be less vulnerable to high winds. Increasing population growth and development increases vulnerability to Severe Weather hazards.

Data Limitations

Some events may have been missed due to limitations in the manner in which events that occurred over multiple forecast zones are reported. Dollar figures reported for Severe Weather events in both SHELDUS and the NCDC Storm Events database are total damages for all counties associated with an event. Specific Elbert County losses are not available. This weather

data is also limited by the observations reported; many events are not recorded with the National Weather Service.

4.2.7 Tornado

Hazard Description

The National Weather Service defines a tornado as a "violently rotating column of air extending from a thunderstorm to the ground." Tornados are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour, and damage paths can be more than one mile wide and 50 miles long. High winds not associated with tornados are profiled in Section 4.2.6 Severe Weather.

Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) Scale. An updated and revised version of the Fujita scale is 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.

Most tornados in northeast Colorado occur between May and July and during the late afternoon or evening hours. Colorado ranks ninth in the country for number of tornados, though the tornados are relatively weak and have a short duration (Colorado Division of Emergency Management, 2009). The most deaths (10) from a tornado event in Colorado occurred on August 10, 1924, in Washington County.

Geographic Location

All participating jurisdictions are at risk of tornados. Tornados are more common in the eastern part of the County further from the Rocky Mountains. Therefore, the risk is likely greater to the town of Simla and the unincorporated communities of Agate and Matheson. In addition, the Planning Committee reports that there is an area in the northwest corner of the County that experiences a greater occurrence of tornados.

Previous Occurrences

There were 80 reported tornados in Elbert County from 1950-2008. Due to the method of recording, some of these tornados may have been in Elbert County's forecast zone and did not actually occur within the County. For instance, the June 6, 1990 F3 tornado that hit the Town of Limon was removed from this list. Table 4.16 lists the reported tornados with associated damage information; additional information on location and costs was not available.

Table 4.16: Elbert County Damaging Tornados, 1950-2008

Year	Description	Cost	Data Source
1952	June 26, 1952. F2 tornado, 7 miles long	$250,000	NCDC
1980	June 19, 1980. F1 tornado	$3,000	NCDC
1983	June 4, 1983. F2 tornado	$250,000	NCDC
2004	May 4, 2004. F2 tornado. Six tornados touched down and demolished the Stuke Ranch. No injuries reported but some buildings demolished.		Planning Committee
2004	June 15, 2004. Three homes in the Rattlesnake Fire District had debris damage.		Planning Committee
2006	June 22, 2006. Damage to trees and house on Badger Lane. House under construction off Painthorse Circle was demolished.		Planning Committee
2008	August 24, 2008. Two confirmed tornado touchdowns caused damage to one residence and damaged power lines about 10-14 miles north of Elizabeth.	5,000	NCDC; Planning Committee

Source: National Climatic Data Center (NCDC), Elbert County Hazard Mitigation Planning Committee.

Probability of Future Occurrences

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

There were 80 reported tornados in 58 years; however, only 7 events have any recorded damages. On average, there is a damaging event every 8 years, or a 12 percent chance in any given year. The NOAA National Severe Storms Laboratory estimates that from 1980-1999, in the area where Elbert County is located, there were 1.2-1.6 days per year when a tornado occurred. The probability is highest in June, when there is an estimated 1.5 percent probability of a tornado occurring on any given day. The chance of a significant tornado of magnitude F2 or greater is less than .2 percent in June.

Magnitude/Severity

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

Tornados can injure and kill people and livestock and destroy structures, infrastructure, and crops. The severity of a tornado is based on wind speed and the amount of property damage incurred. Due to the short time they take to develop and their unpredictable movement, tornados are difficult to respond to and protect lives.

Most tornados in Colorado are weak with wind speeds of less than 110 miles per hour. Of the previous recorded events in Elbert County, three were classified F2 and the remaining were F1 or

F0. However, in neighboring Lincoln County, a F3 tornado (wind gusts 162-209 miles per hour) struck the Town of Limon in June 1990. The tornado was 7 miles long and 500 yards wide. It caused 14 injuries and $25 million in damages (NCDC). It was also reported to have destroyed or damaged 56 businesses and left 75 families temporarily homeless (The Gazette, June 4, 2000).

Vulnerability Assessment

Overview

Although historically there has not been a tornado event in Elbert County that caused fatalities or widespread damage, there is the potential for a strong, damaging event. Fortunately, the areas with highest probability of tornado occurrence in the eastern part of the County also have the lowest population density and sparse development. Public safety can be improved through public education, warning sirens and systems, and safe rooms.

Identifying Structures and Estimating Potential Losses

All above-ground buildings, infrastructure, and critical facilities are at risk to damage and destruction by tornados. Due to the erratic movement of tornados, destruction often appears random. There are no specific identified hazard areas as the entire county is equally susceptible to tornados. Although losses to structures are usually minimal and covered by private insurance, the following estimate is provided assuming a complete loss of a majority of structures throughout the county due to a severe tornado event: $171,530,400. This value represents improved structure value including contents and is derived using HAZUS-MH.

Future Development

Future residential or commercial buildings built to code should be less vulnerable to high winds associated with tornadoes. However, building standards can offer only limited protection. As population and development grow, the vulnerability to more damage tornados grow.

Data Limitations

Due to the isolated nature of tornado events, it is difficult to determine the vulnerability of specific areas. Tornado data is often collected by observations and many events are not reported to the National Weather Service.

4.2.8 Wildfire

Hazard Description

Fire conditions arise from a combination of hot weather, an accumulation of vegetation, and low moisture content in air and fuel. These conditions, especially when combined with high winds and years of drought, increase the potential for wildfire to occur. There are three major factors that sustain wildfires and predict a given area’s potential to burn. These factors are fuel, topography, and weather.

Fuel 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 needles and leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Manmade structures, such as homes and associated combustibles, are also considered a fuel source. The type of prevalent fuel directly influences the behavior of wildfire. Light fuels such as grasses burn quickly and serve as a catalyst for the spread of fire. In addition, "ladder fuels" can spread a ground fire up through brush into trees, leading to a devastating crown fire that burns in the upper canopy and cannot be controlled.

Topography, or an area's terrain and land 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 of vegetation throughout a hillside can also contribute to increased fire activity on slopes.

Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out the fuels that feed the wildfire creating a situation where fuel will more readily ignite and burn more intensely. Wind is the most treacherous weather factor. The greater the wind, the faster a fire will spread and the more intense it will be. In addition to wind speed, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. Lightning also ignites wildfires; often in terrain that is difficult for firefighters to reach. Drought conditions contribute to concerns about wildfire vulnerability. During periods of drought, the threat of wildfire increases. There are many causes of wildfire, from naturally caused lightning fires to human-caused fires linked to activities such as smoking, campfires, equipment use, and arson.

Geographic Location

The Colorado State Forest Service in partnership with federal agencies developed the Colorado Wildland Urban Interface Assessment, which uses three GIS layers to determine fire danger: risk, hazard, and values. Following is the data used to create each layer:

Risk: Probability of ignition

- Lightning strike density
- Road buffer – 100 meter buffer of roads and railroads

Hazard: Vegetative and topological features affecting intensity and rate of spread

- Slope
- Aspect
- Fuels – Interpreted from Colorado Division of Wildlife Gap vegetation information

Values: Natural or manmade components of the ecosystem on which a value can be placed

- Housing density

These layers were combined to create an overall wildfire risk composite ranking, which is shown in Figure 4.9.

The assessment indicates that the wildfire hazard in Elbert County is greater in the western part of the County along the border with Douglas County, on the Palmer Divide, and unincorporated areas surrounding the town of Elizabeth. The wildfire risk is predominantly associated with wildland-urban interface areas (areas where development occurs within or immediately adjacent to wildlands, near fire-prone trees, brush, and/or other vegetation).

Previous Occurrences

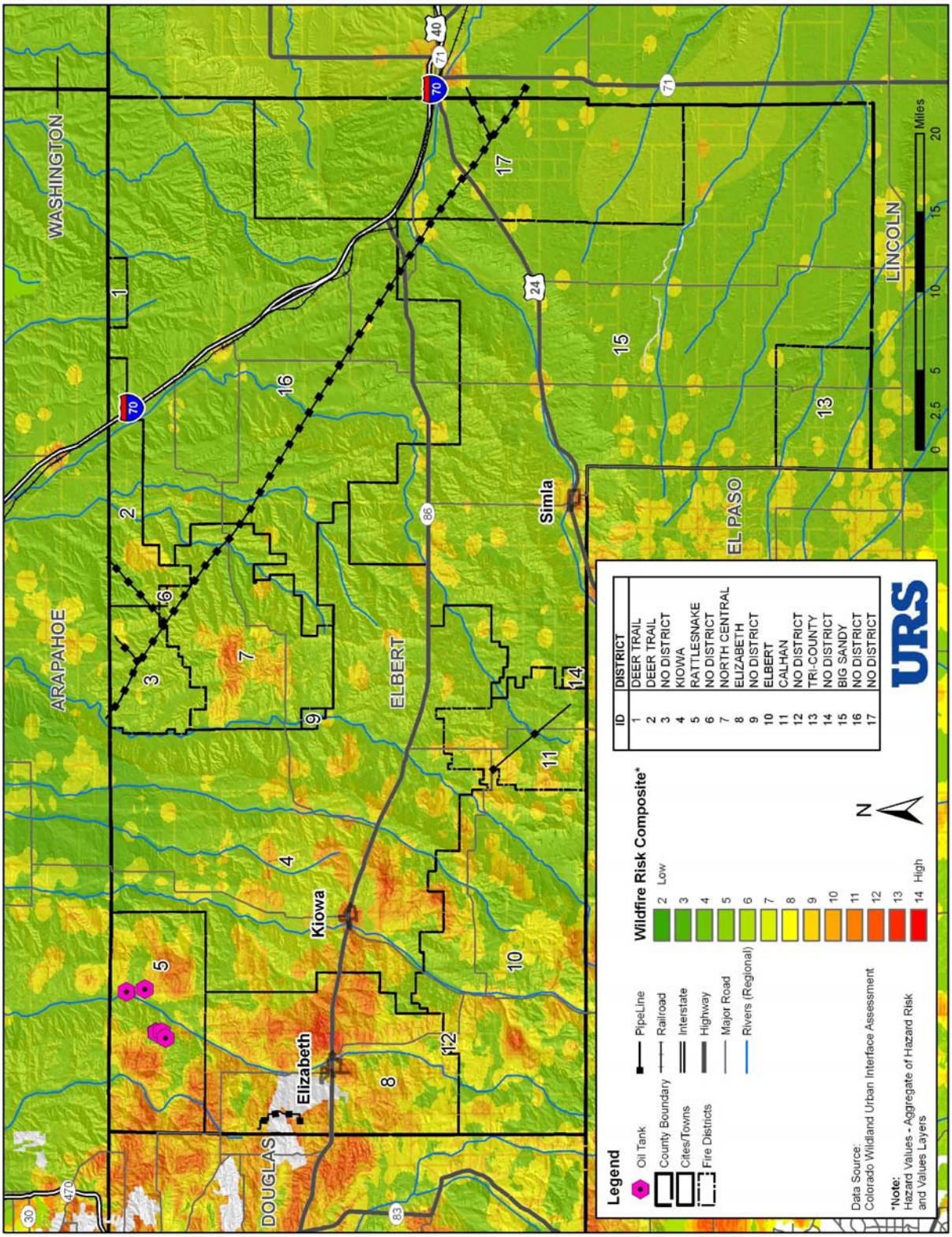
Previous occurrences of wildfires are not well documented. Because land in Elbert County is mostly privately owned, federal land management agencies do not collect fire history information. Local fire districts provided data on more recent fires. Information related to the costs associated with these fires is not available.

Table 4.19 Elbert County Recent Wildfire History

Year	Location	Description	Data Source
2002	Chaparral Subdivision	Wildfire burned 64 acres and two outbuildings.	Planning Committee
2004		November-December, 2004. Grass fires burned 1,000 acres in Kiowa Fire District.	Planning Committee
2005	EC/CR122 N SR86	July 20, 2005. Cowboy Camp fire on 1,000 acres of forested area. Colorado State Forest Service did three slurry dumps.	Planning Committee
2006	MM324 and Hwy 24	March 22, 2006. Wildfire near Matheson	Planning Committee
2008	Northeast of Kiowa	March 21, 2008. Magic Dog Ranch wildfire burned 2,500 acres and threatened eight structures. The fire started north of Highway 86 and the highway was closed for a time because heavy smoke limited visibility. Fire believed to be started due to an electric fence.	Planning Committee, Channel 7 News http://www.thedenverchannel.com/
2008	Countywide	May-June 2008. Multiple wildfires across County. No injuries or damage to structures.	Planning Committee

Source: Elbert County Hazard Mitigation Planning Committee and Channel 7 News http://www.thedenverchannel.com/.

Figure 4.9 Elbert County Wildfire Risk Composite Map



Source: Colorado Wildland Urban Interface Assessment

Probability of Future Occurrences

***Likely**: 10-100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less*

Based on past occurrences, wildfires could occur every year in Elbert County.

Magnitude/Severity

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

Potential losses from wildfire include human life; structures and other improvements; natural and cultural resources; the quality and quantity of the water supply; range and crop lands, and economic losses. Smoke and air pollution from wildfires can be a severe health hazard. Other secondary impacts include future flooding and erosion during heavy rains.

Vulnerability Assessment

Overview

The Colorado State Forest Service and Colorado Division of Emergency Management created the first major statewide wildfire risk assessment in 1999, known as the Mid-Level Risk Assessment. The assessment estimated that .8 percent of acres or 9,411 acres out of 1,182,788 total acres in Elbert County are within moderate to high hazard areas. This assessment has not been updated, and it is likely that the acres in moderate and high hazard areas have increased due to residential development. Outbreaks of insect infestation and disease have also increased fire hazards in the wildland-urban interface.

Identifying Structures and Estimating Potential Losses

The wildfire risk composite map from the Colorado Wildland-Urban Interface Assessment, shown in Figure 4.9, is raster data and suitable for use at the county scale, but not at the subdivision or parcel scale. It is the best data currently available for counties east of Interstate 25. It is not sufficient to identify structures at risk or estimate potential losses.

Homes built in rural areas near uncontrolled vegetation are most at risk. The vulnerability of structures in rural areas is greater due to the lack of fire hydrants in these areas and the travel distance required for firefighting personnel to respond. The Planning Committee identified the Peaceful Valley Boy Scout Ranch as a vulnerable facility due to its high use in the summer. Besides structural losses, many of the costs associated with fires come from the fire suppression costs.

Figure 4.9 shows the location of critical facilities and infrastructure in relation to the assessed wildfire risk. Oil and gas pipelines and oil tank farms are of particular concern.

Future Development

As new development continues to occur in the wildland-urban interface, more people and property are at risk. Neither the County nor the towns have policies in place to address new development in the wildland-urban interface. The threat of wildfire and potential losses will increase as human development and population increases and the wildland-urban interface expands.

Data Limitations

The wildfire risk map from the Colorado Wildland-Urban Interface Assessment project is raster data and suitable for use at the county scale, but not suitable for subdivision or parcel level hazard determinations. This prevented further analysis of structures at risk. An updated wildfire hazard assessment and wildland-urban interface map is needed for the County.

4.2.9 Winter Storm

Hazard Description

Severe winter storm hazards may include snow, ice, blizzard conditions, and extreme cold. Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Extreme cold often accompanies a winter storm or follows.

Geographic Location

Severe winter storms are usually regional events that can occur anywhere in Elbert County with roughly the same magnitude and severity and therefore affect all jurisdictions with similar impacts.

Previous Occurrences

Data from the NCDC and SHELDUS was combined to identify 46 winter storm/heavy snow events from 1960-2008. The two data sources also include an additional 10 events related to freezing temperatures and extreme wind chills. Table 4.18 lists the events that include specific damage information.

Table 4.18 Reported Winter Storm Damages in Elbert County, 1960-2008

Year	Description	Cost	Data Source
1997	December 8, 1997. Snowfall and high winds caused eastern Elbert County to be impacted by extensive blowing snow. Sections of Interstates 25 and 70 were closed, along with several other roads and highways and roads, as travel became impossible in the blowing snow. Several people were stranded. Snowfall total was 8 inches at Kiowa.		NCDC

Year	Description	Cost	Data Source
2003	March, 2003. A winter storm dropped 25 inches of snow causing major road closures and shutting down County.		Planning Committee
2005	March 31, 2005. A strong spring storm brought near blizzard conditions east and southeast of Denver. Extensive blowing snow caused near zero visibilities and snow drifts from two to four feet.		NCDC
2006	October 25, 2006. A storm brought heavy snow to the Interstate 25 Corridor and Palmer Divide. Snowfall was 16 inches near Kiowa and 15 inches near Elizabeth. Strong winds caused areas of blowing and drifting snow with snow drifts up to four feet. The heavy wet snow caused extensive tree damage and downed power lines and power outages.		NCDC
2006	December 20-21, 2006. Snow Declaration #3270-EM-CO	$77,076 claim	FEMA, Planning Committee
2007	April 24, 2007. Blizzard conditions and 12 inches of snow caused power outages for 5 days.		

Source: FEMA, National Climatic Data Center (NCDC), and the Elbert County Hazard Mitigation Planning Committee

In addition, the Planning Committee recalled that sometime during the 1940s severe winter weather caused problems with starving livestock resulting in mass burials.

Probability of Future Occurrences

***Highly Likely**: Near 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less*

There are 56 severe winter storm events affecting Elbert County on record in the last 48 years. On average, there is at least one severe winter storm event each year, which equals over 100 percent chance of occurrence in each year.

Magnitude/Severity

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

From 1971-2000, as recorded at the Elbert station, the coldest month on average is January, with an average minimum temperature of 7.7°F and maximum of 41.1°F. The period of record available for snowfall is 1962-1980. The highest annual snowfall was 128 inches during the winter of 1979-1980. The coldest temperate on record is -39°F in January 1963.

Table 4.19 Elbert County Winter Weather Summary

Station	Winter Average Maximum	Winter Average Minimum	Extreme Minimum Temperature/ Date	# Days Max Temp< 32°F /Year	Average Annual Snowfall	Winter Average Snow Depth	Snowiest Month/ Average Inches
Elbert 1962-1980	43.7	10	-39/ January 1963	22.7	60.5	1 inch	March/16.2
Elizabeth 2 ENE 1996-2008	43.3	18.1	-16/ February 2007	23.1	73.6	1 inch	April/15.6

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

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 tear down trees and power lines. Loss of power affects homes, business, and water, sewer, and other services operated by electric pumps. The cost of snow removal, damage repair, and business losses can have a tremendous impact.

Heavy accumulations of ice and or strong winds can bring down trees, power lines, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until damage can be repaired. Blowing snow can severely reduce visibility. Serious vehicle accidents can result with injuries and deaths. Prolonged exposure to the cold can cause frostbite or hypothermia and can become life-threatening; infants and the elderly are most at risk.

Vulnerability Assessment

Overview

Winter storms in Elbert County cause widespread impacts. The greatest threat is to public safety. The rural nature of the County and the isolated stretches of highway may create problems with stranded motorists and access to supplies and emergency services. In rural areas, homes, farms and livestock may be isolated for days. Power outages caused by snow, ice, and wind accompanied by cold temperatures create additional need for shelter. The Planning Committee identified the need for a plan to protect livestock and dispose/bury dead animals. Other problems for jurisdictions are related to school and business closures, road closures, snow removal, and maintaining critical services.

Identifying Structures and Estimating Potential Losses

Winter storms affect the entire planning area, including all above-ground structures and utilities. Critical facilities and infrastructures are vulnerable to power outages, downed trees, heavy snow loads, and freezing pipes and utility lines. There are no specific identified hazard areas as the entire county is equally susceptible to winter storms. Although losses to structures are usually minimal and covered by private insurance, the following estimate is provided assuming a complete loss of a majority of structures throughout the county due to a severe winter storm:

$171,530,400. This value represents improved structure value including contents and is derived using HAZUS-MH.

Future Development

New structures and facilities built to code should be able to withstand snow loads associated with winter storms. Future development, particularly in more isolated areas, will create access issues and increase demand on road crews and emergency services.

Data Limitations

Some events may have been missed due to limitations in the manner in which events that occurred over multiple forecast zones are reported. Dollar figures reported for Severe Weather events in both SHELDUS and the National Climatic Data Center Storm Events database are total damages for all counties associated with an event. Specific Elbert County losses are not available. This weather data is also limited by the observations reported; many events are never reported or recorded with the National Weather Service. Data on past temperature and snowfall extremes over a larger period of record is not available.

4.2.10 Hazard Profile Summary

This section summarizes the results of the hazard profiles and assigns an overall risk ranking of low, moderate, or high to each hazard. This ranking was determined from the hazard profile, focusing on frequency and resulting damage, including deaths/injuries and property, crop, and economic damage. This ranking was used by the Planning Committee to prioritize hazards of greatest significance to the planning area; thus enabling the County to focus resources where they are most needed.

Table 4.20 Overall Risk Ranking of Hazards

Hazard	Probability	Magnitude	Risk Ranking
Dam and Levee Failure	Unlikely	Critical	Moderate
Drought	Likely	Limited	Moderate
Flood	Likely	Critical	High
Earthquake	Unlikely	Negligible	Low
Severe Weather	Highly Likely	Limited	High
Tornado	Occasional	Catastrophic	High
Wildfire	Likely	Critical	High
Winter Storm	Highly Likely	Critical	High

Table 4.21 Overall Risk Ranking of Hazards by Jurisdiction

Hazard	Elbert County	Elizabeth	Kiowa	Simla	Elizabeth FPD	Kiowa FPD	Rattle-snake FPD	Kiowa Conser-vation District
Dam and Levee Failure	Low	Low	Moderate	Low	Low	Low	Low	High
Drought	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Earthquake	Low	Low	Low	Low	Low	Low	Low	Low
Flood	High	High	High	Moderate	Low	Low	Low	High
Severe Weather	High	High	High	High	Moderate	Moderate	Moderate	Moderate
Tornado	High	High	High	High	Low	Low	Low	Low
Wildfire	High	Moderate	Low	Low	High	High	High	Low
Winter Storm	High	High	High	High	Low	Low	Low	Low

4.3 Community Asset Inventory

The community asset inventory describes the assets at risk to natural hazards in Elbert County, including the total exposure of people and property; critical facilities and infrastructure; natural, cultural, and historic resources; and economic assets.

Total Exposure of Population and Structures

Table 4.22 shows the total population, number of structures, and assessed value of improvements to parcels by jurisdiction. Building counts and values (includes building contents) were taken from HAZUS-MH census block-level data. Land values have been purposely excluded because land remains following disasters, and subsequent market devaluations are frequently short term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

Table 4.22 Population and Building Exposure by Jurisdiction

Community	Population 2007	Number of Structures 2000	Total Structure Value ($)*2000
Elizabeth	1,456	778	12,250,600
Kiowa	610	306	4,102,100
Simla	724	439	4,741,000
Unincorporated Areas	20,302	18,349	150,436,700
Total	23,092	19,872	171,530,400

Source: HAZUS-MH (MR 3) (structures), Colorado Division of Local Government State Demography Office, www.dola.colorado.gov/dlg/demog/pop_cnty.html
*Value represents “improved structure value” and includes contents

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. In addition, critical facilities are those that house vulnerable populations, such as schools and assisted living or senior housing. The tables below list information on each identified critical facility. A map of critical facilities for each jurisdiction follows.

Table 4.23 Elbert County Critical Facilities

Facility Type	Name	Address	Replacement Value
Police Station	Elbert County Sheriff's Office	751 Ute Avenue Kiowa, CO 80117	
School	Elbert School District 200	24489 Main Street	
School	Agate School	41032 2nd Avenue	$4,943,275
Fire Station	Elizabeth FPD STN 13	41002 Firehouse Street	$925,500
Fire Station	Elizabeth FPD STN 12	686 Ponderosa Lane	$105,000
Fire Station	Elbert FPD	24310 Main Street Elbert, CO 80106	
Fire Station	Rattlesnake FPD STN 51	46220 Coal Creek Drive, Elizabeth, CO 80134	$325,000
Fire Station	Rattlesnake FPD STN 52	7117 Sun Country Drive, Elizabeth, CO 80117	$310,000
Fire Station	Rattlesnake FPD STN 53	42593 London Drive, Parker 80138	$440,000
	Rattlesnake Training Facility	46200 Coal Creek Drive Parker, CO 80134	$550,000
Fire Station	North Central FPD	40144 Ridge Road	
Fire Station	Agate Volunteer Department	40961 1st Street Agate, CO	$700,000 includes contents
Fire Station	Kiowa FPD STN 22	42630 CR 53	
Fire Station	Rattlesnake FPD STN 53	42593 London Drive	
Government Center	Elbert County Government Building	215 Comanche Kiowa, CO 80117	
Post Office	Agate Post Office	40992 Highway 40 Agate, CO	$100,000
Power Stations			
Water System Facilities	Agate Water Association		$400,000 Includes buildings, tank, contents
Wastewater System Facilities			
Hospital/Health Care			
Other	Agate Mutual Telephone Association	38619 Monroe Street	$1.4 million
Other (historical)	Russell Gates Mercantile	24223 Eccles Street	$500,000

Table 4.24 Elizabeth Critical Facilities

Facility Type	Name	Address	Replacement Value	Hazard Concern
Police Station	Elizabeth Police Department	425 S. Main Street Elizabeth, CO 80107	$550,000	Tornado
Fire Station	Elizabeth FPD Station 11	155 W. Kiowa Avenue Elizabeth, CO 80107		
Public Works Center	Public Works Facility	303 Washington Street Elizabeth, CO 80107.	$345,000	Tornado
Government Center	Town Hall	321 S. Banner Street Elizabeth, CO 80107	$500,000	Tornado
School	Elizabeth High School	34500 County Road 13 Elizabeth, CO 80107		Tornado
School	Elizabeth Middle School	34427 County Road 13 Elizabeth, CO 80107		Tornado
School	Elizabeth School District C-1 Offices	634 S. Elbert Street Elizabeth, CO 80107		Tornado
School	Running Creek Elementary/ Kids Club	900 S. Elbert Street Elizabeth, CO 80107		Tornado
School	Running Creek Play and Learn Center	476 S. Elbert Street Elizabeth, CO 80107,		Tornado
School	Frontier Childcare/ Kindergarten Enrich Frontier High School	589 S. Banner Street Elizabeth, CO 80107		Tornado
School	Legacy Academy	1975 Legacy Circle Elizabeth, CO 80107	$6,500,000	Tornado
Water System Facilities	Arapahoe Well	856 S. Pine Ridge Dr. Elizabeth, CO 80107	$1,500,000	Contamination, Tornado
Water System Facilities	Dawson Well	856 S. Pine Ridge Dr. Elizabeth, CO 80107	$350,000	Contamination, Tornado
Wastewater System Facilities	Gold Creek Wastewater Treatment Plant	34511 CR 13 Elizabeth, CO 80107	$5,000,000	Flooding, Tornado
Water System Facilities	1.5 M Gallons Water Storage Tanks (3)	882 S. Pine Ridge Dr. Elizabeth, CO 80107		Contamination, Tornado Earthquake
Water System Facilities	Denver Well	882 S. Pine Ridge Dr. Elizabeth, CO 80107	$700,000	Contamination
Wastewater System Facilities	Running Creek Lift Station, Wastewater Treatment Plant	303 Washington Street Elizabeth, CO 80107	$1,500,000	Tornado, Flooding

Facility Type	Name	Address	Replacement Value	Hazard Concern
Wastewater System Facilities	Gold Creek Lift Station	2483 State Highway 86 Elizabeth, CO 80107	$1,000,000	Tornado, Flooding

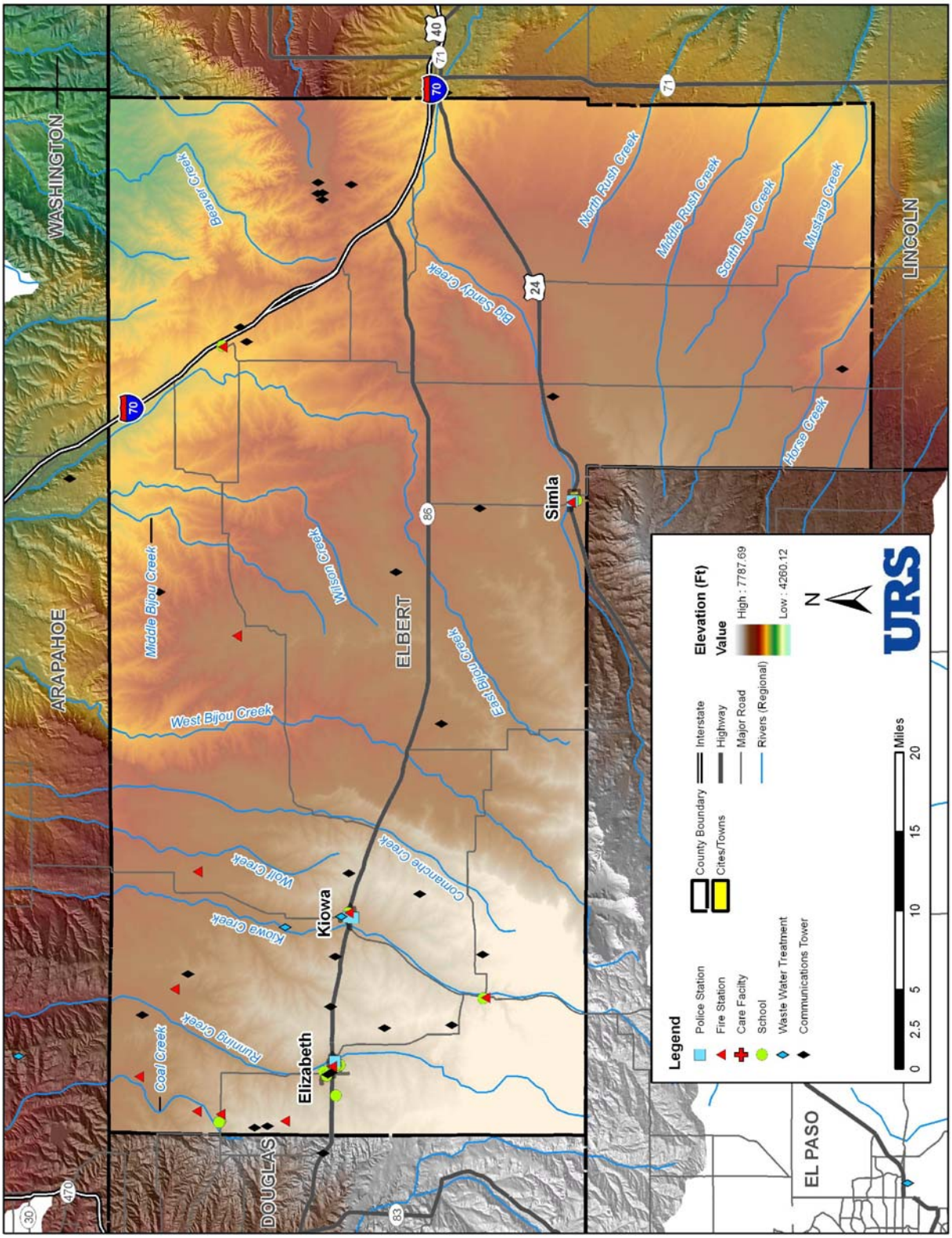
Table 4.25 Kiowa Critical Facilities

Facility Type	Name	Address	Replacement Value
Police Station	Kiowa Police Department	404 Comanche Street Kiowa, CO 80107	$150,000
School	Kiowa School	525 Comanche Street Kiowa, CO 80107	
Fire Station	Kiowa FPD STN 21	403 CR 45 Kiowa, CO 80107	
Government Center	Kiowa Town Hall	404 Comanche Street Kiowa, Co. 80117	$275,250
Post Office	Kiowa Post Office	708 Comanche Street Kiowa, CO 80117	
Water System Facilities	Well House and Pump House storage tank	316 Navajo Street Kiowa, CO 80117	$55,000
Water Facilities	Well House and Pump House #2	601 CR 45 Kiowa, CO 80117	$20,000
Water Facilities	Well House and Pump House #2	601 CR 45 Kiowa, CO 80117	$184,000
Water Tower and Pump	Water Tower and Pump Equipment	12115 Hwy 86 Kiowa, CO 80117	$1.2 million
Water Storage Building	Town of Kiowa Shop	320 Navajo Street Kiowa, CO 80117	$168,000
Wastewater System Facilities	Kiowa Wastewater Treatment Plant and lagoons	S/W 1/4 section 17 Kiowa, CO 80117	$2.2 million
Park/Playground	Nordstorm Park	Arapahoe and Navajo Streets	$80,000

Table 4.26 Simla Critical Facilities

Facility Type	Name	Address	Replacement Value
Police Station	Simla Police Department	325 Pueblo Avenue	$20,000
School	Big Sandy School	619 Pueblo Avenue	8915900
Fire Station	Simla Fire Department	219 Sioux Avenue,	$350,000
Government Building	Simla Town Office	323 Pueblo Avenue	$135,000
	Simla Maintenance Shop	803 Buffalo	$180,000
Post Office	U.S. Post Office	611 Caribou	
Power Stations	Mountain View Electric Substation	31200 Summit	
Water System Facilities	Simla Water Treatment Plant Water Wells Water Storage Tanks.	100 Adams-209 Pueblo 208 Washington 108 Navajo-322 Navajo 811 Pueblo	Wells-$60,000 each Tanks–$250,000 each
Wastewater System Facilities	Simla Sewer Lagoons	1109 Antelope	$1,500,000
Shelter	White House(old municipal building)	325 Pueblo Avenue	
Other	Good Samaritan Center	320 Pueblo Avenue	

Figure 4.10 Elbert County Critical Facilities



Source: Elbert County GIS

Natural, Historic, and Cultural Assets

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

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

Natural Resources

Natural resources are important to include in a benefit-cost analyses for future projects. They may be used to leverage additional funding for projects that contribute to other community goals as well. A number of natural resources exist in Elbert County, including wetlands, endangered species, and imperiled plant communities.

Wetlands

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

Endangered Species

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

According to the U.S. Fish and Wildlife Service, as of February 2008, there were seven federal endangered, threatened, or candidate species in Elbert County. These species are listed in Table 4.27.

Table 4.27 List of Rare Species in Elbert County

Common Name	Scientific Name	Type of Species	Status
Arkansas Darter	Etheostoma cragini	Fish	Federal Candidate Species
Black-Footed Ferret	Mustela nigripes	Mammal	Federally Endangered
Least Tern (interior population)	Sternula antillarum	Bird	Federally Endangered
Pallid Sturgeon	Scaphirhynchus albus	Fish	Federally Endangered
Piping Plover	Charadrius melodus	Bird	Federally Threatened
Preble's Meadow Jumping Mouse	Zapus hudsonius preblei	Mammal	Federally Threatened
Whooping Crane	Grus americana	Bird	Federally Endangered

Source: Endangered, Threatened, Proposed and Candidate Species Colorado Counties (February 2008), U.S. Fish and Wildlife Service Mountain-Prairie Region, www.fws.gov/mountain-prairie/endspp/;

Historical and Cultural Resources

National and state historic inventories were reviewed to identify historic and cultural assets in Elbert County. The National Register of Historic Places is the Nation's official list of cultural resources worthy of preservation. The Colorado State Register of Historic Properties is a listing of the state's significant cultural resources worthy of preservation for the future education and enjoyment of Colorado's residents and visitors. Table 4.28 lists the properties in Elbert County that are on the Colorado State Register of Historic Properties. Those properties that are also on the National Register of Historic Places are indicated with an asterisk.

Table 4.28 Elbert County Historic Properties/Districts in State and National Registers

Property Name	City	Location	Date Listed
Denver and New Orleans Railroad Segment	Elbert vicinity	Along Elbert Road., south of Elbert	12/13/1995
J Bar Double C Ranch	Elbert vicinity	21441 County Road 35-41	9/8/2004
Sacred Heart Church	Elbert	7211 County Road 98	3/8/1995
*St. Mark United Presbyterian Church	Elbert	225 Main Street	9/18/1980
Huber Building (Carlson Building)	Elizabeth	239 Main Street	3/8/1995
Fondis Store	Fondis	Intersection of Elbert County Roads 69 and 98	3/13/2002

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

The Sacred Heart Church was originally built on the banks of Boxelder Creek. The devastating flood of 1935 nearly swept the building away. It was moved to higher ground east to mitigate future damage.

It should be noted that as defined by the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as, agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster. After a disaster, economic vitality is the engine that drives recovery. Every community has a specific set of economic drivers, which are important to understand when planning ahead to reduce disaster impacts to the economy. When major employers are unable to return to normal operations, impacts ripple throughout the community. Table 4.29 lists the top employers in Elbert County by number of employees.

Table 4.29 Top Employers in Elbert County

Name	Address	City
100-250 Employees		
Peaceful Valley Scout Ranch	22799 North Elbert Road	Elbert
50-100 Employees		
Big Sandy School	619 Pueblo Avenue	Simla
Elbert County Courthouse	215 Comanche Street	Kiowa
Elbert County School District C2	525 Comanche Street	Kiowa
Elbert School District 200	24489 Main Street	Elbert
Elizabeth School District	34500 County Road 13	Elizabeth
Good Samaritan Center	320 Pueblo Avenue	Simla
Jcc Ranch	21441 N Elbert Road	Elbert
Rocky Mountain Fiber Plus, Inc	33555 County Road 37	Kiowa
Safeway	220 Elizabeth Street	Elizabeth

Source: Colorado Department of Labor and Employment, http://lmigateway.coworkforce.com/

4.3.5 Social Vulnerability

Certain demographic and housing characteristics affect overall vulnerability to hazards. These characteristics, such as age, race/ethnicity, income levels, gender, building quality, public infrastructure, all contribute to social vulnerability.

A Social Vulnerability Index compiled by the Hazards and Vulnerability Research Institute in the Department of Geography at the University of South Carolina measures the social vulnerability of U.S. counties to environmental hazards for the purpose of examining the differences in social vulnerability among counties. Based on national data sources, primarily the 2000 Census, it synthesizes 42 socioeconomic and built environment variables that research literature suggests contribute to reduction in a community's ability to prepare for, respond to, and recover from hazards. Eleven composite factors were identified that differentiate counties according to their relative level of social vulnerability: personal wealth, age, density of the built environment, single-sector economic dependence, housing stock and tenancy, race (African American and Asian), ethnicity (Hispanic and Native American), occupation, and infrastructure dependence.

Compared to other counties in the nation and in Colorado, Elbert County's social vulnerability is low (bottom 20 percent). To better understand the characteristics behind this ranking, the Planning Committee researched information from the 2000 Census on four factors of social vulnerability: gender, age, language spoken in home, and poverty. These factors were analyzed for Elbert County as a whole and for Elizabeth, Kiowa, and Simla. One characteristic of social vulnerability is differential access to resources and greater susceptibility to hazards. All factors considered here are related to this characteristic.

Table 4.30 displays these variables and compares them to the same variables for Colorado and the United States. These factors of social vulnerability hold many implications for disaster response and recovery and are important considerations when identifying and prioritizing mitigation actions and overall goals and objectives of the plan.

Table 4.30 Social Vulnerability from 2000 U.S. Census

Jurisdiction	Total Population	Total Housing Units	% Females	% Under Age 18	% Age 65 and Over	% Speak Language Other than English in Home*	% Individuals Below Poverty Level*
United States	281,421,906	115,904,641	50.9	25.7	12.4	17.9	12.4
Colorado	4,301,261	1,808,037	49.6	25.6	9.7	15.1	9.3
Elbert County	19,872	7,113	49.8	30.2	6	4.8	4.0
Elizabeth	1,434	513	48.7	33.3	4.2	3.9	9.2
Kiowa	581	243	48.5	30.5	7.2	3.1	6.8
Simla	663	261	51.7	32.4	15.4	6.3	17.2

Source: 2000 Census, U.S. Census Bureau *Based on sample data. The Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty.

Gender

Women may have a more difficult time recovering from disaster than men because of sector-specific employment, lower wages, and family care responsibilities. Differences are not significant and the data indicates that in the case of Elbert County, gender does not increase the social vulnerability of the planning area.

Age

Age can affect the ability of individuals to move out of harm's way. The Planning Committee analyzed two variables for age, percentage of population over 65 and percentage under age 18. At 24 percent, the percentage of Elbert County's population under 18 is about five percent higher than Colorado as a whole and the percentage over age 65 is about five percent lower. The exception is Simla, where the population over the age of 65 (15.4%) is slightly higher than the rest of the County. Percentages range from 15.4 in Cedaredge to 4.2 in Elizabeth.

Language Spoken in Home

The language spoken in the home can signify language and cultural barriers that affect communication of warning information and access to post-disaster information. In Elbert County, 5.1 percent of the population speaks a language other than English in the home. This is lower than both the U.S. (17.9) and Colorado (15.1) percentages. The language spoken in the home is not likely to increase social vulnerability in the planning area but should still be considered by the County in regard to communication efforts.

Poverty

Wealth and poverty also are indicators of social vulnerability. Low income and impoverished populations have fewer resources available for recovery and are more likely to live in structures of greater physical vulnerability. Individuals and communities with greater wealth have more ability to absorb losses and be resilient in the face of disaster due to factors such as insurance and social safety nets. They also have greater capabilities to mitigate hazards and greater access to funds for recovery.

To compare wealth and poverty, the Planning Committee analyzed the percentage of individuals below the poverty level and the median home value in each community in Elbert County. Overall, Elbert County's percentage of individuals living below the poverty level (4.0) is much lower than that of the nation (12.4) or Colorado (9.3). The exception is Simla, where the percentage of individuals below the poverty level (17.2) is much higher than the other towns and unincorporated areas and the median value of single-family, owner-occupied homes is much less.

4.4 Land Use and Development Trends

This section provides a general description of land uses and development trends within unincorporated Elbert County and the towns of Elizabeth, Kiowa, and Simla and includes data on growth in population and housing units for each jurisdiction.

Elbert County is currently updating their Master Plan and zoning designation, so there was not a current and accurate map of land use and zoning available to include in this plan.

Tables 4.31-4.34 provide information on growth in population and housing units for each jurisdiction.

Table 4.31 Population Growth in Elbert County, 2000-2007

Jurisdiction	2000	2007	Percent Change (%)
Elizabeth	1,434	1,456	1.5
Kiowa	581	610	4.9
Simla	663	724	9.2
Unincorporated Area	17,194	20,302	18.0
Total County	**19,872**	**23,092**	**16.2**

Source: Colorado Department of Local Affairs Demography Section, www.dola.colorado.gov/dlg/demog/

Table 4.32 Growth in Housing Units in Elbert County, 2000-2007

Jurisdiction	2000	2007	Percent Change (%)
Elizabeth	513	549	7.1
Kiowa	243	264	8.6
Simla	261	304	16.4
Unincorporated Area	6,096	7,691	26.2
Total County	**7113**	**8,808**	**23.8**

Source: Colorado Department of Local Affairs Demography Section, www.dola.colorado.gov/dlg/demog/

Table 4.33 Population and Housing Unit Density in Elbert County, 2000-2007

Jurisdiction	Area in Square Miles	2000 Population Density	2007 Population Density	2000 Housing Unit Density	2007 Housing Unit Density*
Elizabeth	.86	1,670.6	1,693	597.6	638.4
Kiowa	.49	1,190.3	1,244.9	497.9	538.8
Simla	.54	1,222.3	1,340.7	481.2	562.9
Unincorporated Area	1850	9.3	10.97	4.2	4.2
Total County	**1851.89**	**10.7**	**12.5**	**3.8**	**4.2**

Sources: Colorado Department of Local Affairs Demography Section, www.dola.colorado.gov/dlg/demog/, U.S. Census Bureau, www.census.gov/

Table 4.34 Population Projections for Elbert County, 2010-2035

	2005	2010	2015	2020	2025	2030	2035
Population	22,699	23,606	29,233	39,603	49,144	57,420	64,607
Percent Change (%)	2.4	0.8	4.4	6.3	4.4	3.2	2.4

Sources: Colorado Department of Local Affairs Demography Section, www.dola.colorado.gov/dlg/demog/, November 2008.

The County has experienced steady growth (more than 16%) over the seven-year period studied for this plan. Population growth is most pronounced in the unincorporated areas of Elbert County (18%), as residents in the Denver and Colorado Springs metropolitan areas seek a more rural lifestyle. The unincorporated areas and the Town of Silma have seen dramatic increases in the number of housing units constructed although the density has remained relatively flat. The participating jurisdictions have zoning ordinances that allow for large lot subdivisions, which are highly sought after in the marketplace. However, these types of developments and rural areas in general are the most difficult to serve in emergency situations, where roads are often unpaved and can become impassable during winter storms.

Elbert County

Most of Elbert County is rural in nature and consists of large tracts of farming and ranching lands. The County's proximity to the Denver and Colorado Springs metropolitan areas has resulted in increasing growth and development in the western part of the County. This growth has manifested in the development of numerous rural subdivisions. There has not been diverse economic development to support these new areas and most of the residents travel outside of the County for work.

Future residential growth is projected to occur primarily along the western border of the County, adjacent to Douglas County, due to the growth in the south metropolitan area that has resulted in extensive services along the I-25 corridor. Homeowners looking for larger lots and rural atmosphere will continue to look at Elbert County. There is potential for economic growth along the I-70 corridor in the northeast part of the County, particularly due to the proximity to the Denver International Airport. Southwest Elbert County could see future growth due to the proximity to Colorado Springs.

Elizabeth Fire Protection District: Development is occurring mostly in the northwest quandrants, creating increased need for emergency medical services response and fire response.

Town of Elizabeth

Elizabeth has experienced growth in recent years both within boundaries and through annexations. In Elizabeth, development pressure is greatest on the western boundary. The Town desires to preserve the Gold Creek and Running Creek corridors as open space and trails. Overall, the community believes that their vulnerability in terms of land use and development trends is greatest to the hazards of flooding and tornados. Evacuation becomes a greater concern with increasing population as State Highway 86 is the main access route.

Town of Kiowa

Kiowa has experienced growth in recent years both within boundaries and through annexations. Most development in Kiowa occurs in a Planned Development Area. The Town makes developers aware that if they are planning residential areas of growth, they must have retail and service-oriented businesses as well as commercial and light industrial areas to support the residential side of their planned development. The Town has decided that clusters of residential homes need to have employers, retail, and restaurants. The Town expects to have continued growth as people seek a more rural lifestyle than that available in the Denver and Colorado Springs metropolitan areas. There are several proposals for new Planned Development projects that are waiting for increased market demand.

Town of Simla

The Town of Simla has experienced increasing population and development due to its rural charm and proximity to employment opportunities in Colorado Springs.

4.5 Capability Assessment

Mitigation capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capability assessment is divided into four sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, and mitigation outreach and partnerships.

Regulatory Mitigation Capabilities

Table 4.35 summarizes the existing regulatory tools and planning mechanisms for Elbert County and the participating jurisdictions. These plans, codes, and ordinances form a framework that supports this hazard mitigation plan. It is expected that future updates of these planning mechanisms will acknowledge, integrate, and implement this hazard mitigation plan, as necessary.

Table 4.35 Regulatory Mitigation Capabilities

Capability	Elbert County	Elizabeth	Kiowa	Simla
Master Plan	Yes	Yes	Yes	Yes
Emergency Operations Plan	Yes	No	Yes	Yes
Economic Development Plan	No	No	Yes	No
Capital Improvements Plan	No	Yes	Yes, Comprehensive plan for each department with capital improvements on schedules	No
Community Wildfire Protection Plan	No	No	No	No
Building Code	Yes	Yes	Yes	Yes
Building Code Year	IBC 2006	IBC 2006	IBC 2006	1994
Floodplain Ordinance	Yes	Yes, not FEMA	Yes	No
Zoning Ordinance	Yes	Yes	Yes	No
Subdivision Ordinance	Yes	Yes	Yes	Yes
Stormwater Ordinance	Yes	Yes, needs updating	Yes	No

Capability	Elbert County	Elizabeth	Kiowa	Simla
Growth Management Ordinance	No	No	No	No
Site Plan Review Requirements	Yes	Yes	Yes	No
Erosion/Sediment Control Program	Yes	Yes	No	No
Stormwater Management Program	Yes	Yes	Yes, currently conducting a surveying and drainage project	No
National Flood Insurance Program Participant	Yes	No, evaluating	Yes	Yes, recently adopted
Other			Continuity of Operations Plan updated annually	

Elbert County

The Elbert County Master Plan (revised 2005) identifies broad-based development goals and develops a coordinated program of public and private actions necessary to achieve those goals. The Master Plan is intended to guide development by evaluating physical elements such as housing, transportation, open space and recreation, infrastructure, and community facilities, along with socio-economic development based on input from County residents. Goals and policies in the Master Plan that support hazard mitigation are listed in the tables below.

Table 4.36 Elbert County Master Plan Policies

Land Use Policies: Environmental Constraints
3. All development and utility corridors shall be directed away from significant ridge lines, mesas, riparian zones, forests, and other areas determined to be environmentally or visually sensitive.
4. Developments shall be planned a manner that minimize disturbances to the environment. Disturbance to woodlands, slopes and natural drainages shall be kept to a minimum to ensure that erosion, sedimentation, runoff, and loss of cover are minimized.
5. The County shall discourage development within the 100-year floodplain unless associated with wildfire management, non-polluting recreational uses, or agricultural uses.
8. The County shall not allow development and reserves the right to disapprove development on excessive slopes (20 percent and over) and rock fall zones.
9. The County shall not allow development within geologic hazard areas posing a threat of injury, loss of life, or property damage.
10. Measures designed to mitigate geological constraints shall be directed by an independent geologist/and or geotechnical engineer who is paid by the developer by chosen by the County and utilized procedures outlined by the Colorado Geological Survey
11. Development proposals shall include plans to control surface drainage, erosion and/or sedimentation problems.
12. The County shall limit development in areas of severely expansive soils, in areas with less severely expanding soils, professional engineering and other mitigating design features shall be employed where appropriate.

Land Use Policies: Recreation and Open Space
1. Within existing and proposed residential, commercial, and industrial development areas, major riparian areas, floodplains, and woodlands should form the basis of an open space and trails systems. This system should be limited to non-motorized vehicles, pedestrians, and equestrian uses.
3. The County shall establish an open lands plan to be used as a guide for the preservation of environmentally sensitive and agriculturally viable lands.
Community Resources Policies: Community Services
21. Development shall be encouraged to minimize consumption of water use and maximize the efficient use of water.
24. As development occurs, the County and developer(s) shall cooperate in updating existing facilities and constructing additional fire protection facilities – especially in rural areas where fire equipment and protection are not readily available.
Natural Resources Policies: Natural Conditions
10. The County shall require native or low water consumptive xeriscape plants. Standards shall be established to reduce the use of high water consumptive plants and to encourage low water irrigation techniques when site plans are required
Natural Resources Policies: Environmental Quality
6.The County shall require erosion-control plans for any new developments in the County
7. Wastewater systems which recycle or reuse effluent are encouraged for subdivision with lost sizes of five acres or less.

The Master Plan also includes the following general standards for development related to mitigation:

- Undergrounding of all utilities
- Residential, commercial, or industrial development shall not occur in 100-year floodplains, slopes greater than 20 percent, or other hazardous areas.
- Building envelopes shall be required on lots with hazardous and premium areas
- Design standards

Elbert County has adopted the Urban Drainage Flood Control District Storm Drainage Criteria Manual in Section 600 of the Elbert County Road and Bridge Manual.

Town of Elizabeth

The Town of Elizabeth Community Master Plan (revised 2008) provides information, policies, and guidance on several community topics, including land use, community character, public services and facilities, and environmental quality. Policies that support hazard mitigation are listed in Table 4.37

Table 4.37 Elizabeth Master Plan Policies

Environmental Quality Policies
Encourage use of conservation easements to preserve and protect natural systems
Protect wildfire corridors and landscape features when reviewing development, rezoning, and/or special use, or variance requests.
Implement measures necessary to prevent erosion or to contain soils
Discourage construction practices that significantly alter the landscape, destroy natural vegetation, or result in erosion.
Incorporate retention and detention facilities to reduce soil erosion, channel degradation, and flooding
Plan the parks, trails, and open space system to serve as a drainage and flood control system, thereby slowing the rate and reducing the intensity of stormwater runoff
Promote the use of natural or naturalistic drainage approaches that allow dual recreation usage and serve as both functional and aesthetic elements within the developments
Protect area streams and groundwater from point and nonpoint sources of pollution and runoff
Evaluate the impact of proposed drainage improvements, including the resulting water quality and ongoing maintenance requirements
Evaluate the impact of proposed drainage improvements, including the resulting water quality and ongoing maintenance requirements
Protect wetlands, riparian areas, and associated wildfire habitat through a combination of careful land development and drainage system design
Support efforts to establish renewable water supplies and encourage water conservation

Town of Kiowa

Kiowa processes all new major developments as Planned Development Area zoning, which allows the Town to address any known hazardous conditions with each development plan submitted for approval. For example, if the site is located in proximity to Kiowa Creek, the Preble's Meadow Jumping Mouse and its protection is addressed. Kiowa has a watershed protection district, which is governed by ordinances and regulations that protect the Town's wastewater system. All applications for development must also prepare a report based on the Kiowa Drainage Criteria, which was adopted and protects all low-lying areas. It also addresses how new development will affect the future drainage of surrounding areas. The Master Trails System will connect all projects, including those within the Town's three-mile sphere of influence to all for trails for all residents. Kiowa is also implementing a water conservation program that will include discounts and/or rebates for water conservation.

The Town of Kiowa developed a Continuity of Operations Plan (COOP) in 2006-2007, which includes the emergency plans and directives that Kiowa agency and staff will take during an emergency event. The COOP plan is updated annually with any changes in personnel or policies.

Fire Protection Districts

The Rattlesnake Fire Protection District works in coordination with Elbert County regulatory tools and policies. The Kiowa and Elizabeth Fire Protection Districts work in coordination with policies of the County and their respective towns.

Administrative and Technical Capabilities

Table 4.38 identifies the personnel responsible for activities related to mitigation and loss prevention in Elbert County and the participating jurisdictions.

Table 4.38 Administrative and Technical Capabilities

Administrative/ Technical Resources	Elbert County	Elizabeth	Kiowa	Simla	Rattlesnake FPD	Kiowa Conser-vation District
Planner/ Engineer with knowledge of land development practices	Engineer contractor	Town planner	Engineer contractor	No	No	Yes
Engineer/ Professional trained in construction practices related to buildings/ infrastructure	Engineer contractor	Engineer contractor	Engineering contractor	No	Yes, plan reviews	No
Planner/ Engineer/ Scientists with understanding of natural hazards	Engineer contractor	Assessor	Engineer contractor	No	No	Yes
GIS capabilities	Assessors Office, Communications	No	Town Administrator and Elbert County Assessor	No	Yes, Elbert County	Yes
Full-time building official	Building Department/ Director	Contract	Building Department/ Director	Part time	N/A	N/A
Floodplain administrator	Community Development Department	Yes, Town Planner	Planning Department	No	N/A	N/A
Emergency manager	Office of Emergency Management	No	No	No	No	No
Grant writer	No	No	Police Department and Town Administrator	No	Yes, firefighter	No
Warning Systems/ Services	CODE Red Weather Warning System and Reverse Notification	CODE Red Weather Warning System and Reverse Notification	CODE Red Weather Warning System and Reverse Notification	Outdoor warning signal	CODE Red Weather Warning System and Reverse Notification	No

The Elizabeth and Kiowa fire protection districts did not list these administrative or technical capabilities.

Fiscal Mitigation Capabilities

Table 4.39 identifies financial tools or resources that communities could potentially use to help fund mitigation activities.

Table 4.39 Fiscal Mitigation Capabilities

Financial Resources	Elbert County	Elizabeth	Kiowa	Simla	Elizabeth FPD	Kiowa FPD	Rattle-snake FPD	Kiowa Conser-vation District
Community Development Block Grants	Yes	Yes	Yes	Yes	No	No	No	*No*
Capital improvements project funding	Yes	Yes	Yes	Yes	Yes	No	No	No
Authority to levy taxes for specific purposes	Yes	Yes, with voter approval	Yes	No	Yes	No	Yes	No
Fees for water, sewer, gas, or electric services	No, septic permit	Water, Sewer	Water, Sewer	Water, Sewer	No	No	No	No
Impact fees for new development	Yes	Yes	Yes	No	No	Yes	Yes	No
Incur debt through general obligation bonds	Yes	Yes, with voter approval	Yes	No	Yes	Yes	No	No
Incur debt through special tax bonds	Yes	Yes, with voter approval	Yes	Yes	Yes	Yes	No	No
Withhold spending in hazard-prone areas	Yes	No	No	No	No	No	No	No

Mitigation Outreach and Partnerships

The participating jurisdictions noted the following existing outreach programs they participate in related to risk reduction:

- Rattlesnake Fire Protection District conducts wildland fire safety education through newsletters.

- The Elizabeth Fire Protection District has a fire prevention and public education program and regularly distributes press releases for fire safety and household preparedness.
- Elbert County Schools teach fire safety in conjunction with the fire departments.
- Kiowa is an active participant on the Board of the Elbert County Coalition Outreach.
- Kiowa is working to develop a special needs database and currently has the ability to communicate to low-income residents.
- Elizabeth conducted public forums to discuss joining the NFIP.

4.6 Risk Assessment Summary

Multi-Hazard

- The majority of population and structures in Elbert County are in unincorporated areas.
- The largest employers in the County are Peaceful Valley Boy Scout Ranch, schools, County government, and Safeway.
- Social vulnerability is highest in Simla, due to greater elderly and low-income populations.
- Development trends are characterized by numerous rural subdivisions in the western County.

Dam and Levee Failure

- There are 110 dams in Elbert County but all are low hazard classification.
- Funding for maintenance and repair of conservation district dams is limited.
- There is a lack of public awareness about the conservation district dams and safety.
- The condition, age, and owner of the levee providing protection to Kiowa on Kiowa Creek are unknown. The level of protection provided by the levee in a flood event is unknown.

Drought

- Palmer Drought Severity Index: Elbert County has experienced severe and extreme drought 15-20 percent during the previous 100-year period.
- In the South Platte Basin, the greatest impacts due to drought are loss of water supply and system flexibility and loss of crop yield.
- Many rural residents in Elbert County get water from private wells.
- Population growth and climate change are factors likely to increase vulnerability to drought

Flood

- There are six flood insurance policies in Elbert County and approximately 500 structures in the 100-year floodplain.
- Elbert County has a long history of damaging floods, including four federal disaster declarations and the catastrophic flood of 1935.
- Problem areas include Kiowa Creek in Kiowa and Running Creek in Elizabeth.

- Vulnerable assets include roads, bridges, structures in floodplain and Kiowa School.
- New DFIRMs will create more accurate risk information on which to base future mitigation measures.
- Elizabeth has not joined NFIP; therefore, flood insurance is not available to property owners and the community is not required to manage development in the floodplain according to minimum NFIP requirements. However, the Town does have floodplain polices in place.

Severe Weather

- Hail storms can block culverts and drainage structures causing flooding.
- Hail damage is costly but usually covered by private insurance.
- Lightning causes damage to communications systems.
- Public education and warning about lightning safety can help prevent deaths and injuries.
- High winds damage structures and cause power outages.

Tornado

- The tornado hazard is greater in the eastern part of County, including the communities of Simla, Agate, and Matheson.
- Hazard is greatest in May, June, and July.
- Tornado strength is generally weak, but an F3 tornado hit Limon in 1990.
- Warning sirens and systems and safe room and sheltering needs should be assessed.

Wildfire

- Wildland-urban interface areas with high wildfire hazard are primarily in the western part of the County near the border with Douglas County.
- Drought conditions contribute to fast-moving grassland fires.
- Accurate or updated wildfire hazard assessment data is not available for Elbert County.
- The location of pipelines in relation to high wildfire hazard areas is a concern.
- The Peaceful Valley Boy Scout Ranch is a community asset and one of the County's largest employers. It is vulnerable to wildfire due to high use in summertime.
- Local jurisdictions have limited wildfire policies adopted as part of planning and zoning.

Winter Storm

- Winter storms are highly likely and can be critical in magnitude.
- The greatest impacts of winter storms are often related to shutting down transportation routes - blocking the flow of supplies, isolating rural areas, and stranding travelers.
- Snow, ice, and downed trees can cause power outages.
- Winter storms create need for sheltering and outreach to vulnerable and isolated populations.
- The starvation of livestock and subsequent burial/disposal needs are a concern.

CHAPTER 5 MITIGATION STRATEGY

44 CFR Requirement §201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

4 CFR Requirement §201.6(c)(3)(i): [The mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

4 CFR Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include] a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. [The mitigation strategy] must also address the jurisdictions' participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

44 CFR Requirement §201.6(c)(3)(iii): The mitigation strategy shall include an action strategy describing how the actions identified in paragraph (c)(2)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefits review of the proposed projects and their associated costs.

44 CFR Requirement §201.6(c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval for credit of the plan.

This chapter describes the mitigation strategy developed by the Elbert County Hazard Mitigation Planning Committee (Planning Committee) based on the risk assessment described in Chapter 4.

Plan Update: The Planning Committee reviewed and revised the 2003 mitigation strategy made up of goals, objectives, and actions through a collaborative group process at their second, third, and fourth meetings. The 2009 mitigation strategy consists of a mission statement, goals, and mitigation actions, which are defined as follows:

- The **Mission** is a statement that defines the plan's purpose for existence and primary function.
- **Goals** are general guidelines that explain what the plan means to achieve. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. They are meant to be achieved over the long term and typically consist of broad, policy statements.
- **Mitigation Actions** are specific actions designed for implementation that help achieve the goals.

5.1 Plan Mission and Goals

The Planning Committee evaluated the previous plan goals and developed new goals to provide direction for reducing the impacts of the hazards profiled in the risk assessment. The goals from the previously approved 2003 plan were the following:

- Maintain FEMA eligibility/position communities for federal mitigation funding
- Improve County capabilities to reduce disaster losses
- Reduce loss of life and property from weather hazards
- Increase public awareness of potential hazard losses

To update the goals, the Planning Committee reviewed the results of the updated risk assessment and the goals and objectives in the Colorado State Natural Hazard Mitigation Plan at their second meeting on April 14, 2009. The Planning Committee updated the goals to be more supportive of the comprehensive range of mitigation action types needed to reduce vulnerability (described further in Section 5.2). After reviewing and revising a sample mission statement and goals presented by the consultant, the Planning Committee came to consensus on the mission statement and goals presented in Table 5.1 for the 2009 plan update.

Table 5.1 Elbert County Multi-Hazard Mitigation Plan Mission and Goals

Mission
Reduce risk to the people and property of Elbert County from the impacts of natural hazards
Goals
1) Improve education and awareness of hazards and risk reduction measures
2) Protect critical facilities, infrastructure, and other community assets from hazards
3) Incorporate hazard mitigation into future development plans and policies
4) Enhance local mitigation capabilities, including human, technical, financial, and regulatory capabilities
5) Improve communication and coordination of mitigation activities between federal, state, and local governments and with private and non-profit organizations

5.2 Identification of Mitigation Action Alternatives

To update the mitigation actions from the previously approved plan, the agency listed as responsible for each action completed a status worksheet describing whether the action was completed, uncompleted, or ongoing. This worksheet is provided in Appendix D Mitigation Action Evaluation. The Planning Committee used this information at their third and fourth meetings to identify and prioritize mitigation actions.

To begin identifying a comprehensive range of mitigation actions at their third meeting on May 12, 2009, the Planning Committee discussed the six categories of mitigation actions shown in Table 5.2.

Table 5.2 Categories of Mitigation Actions

Category	Definition
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 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 ensure the continuity of emergency services
Public Education and Awareness	Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them

Source: National Flood Insurance Program Community Rating System

The Planning Committee examined the five updated goals and each participant brainstormed three actions to further three of the five goals. The Planning Committee sorted these actions by the six categories to ensure that a comprehensive range of actions were identified. Next, the actions were resorted by hazard type. The earthquake hazard was not specifically considered further in the mitigation strategy due to its low probability, magnitude/severity, and the low vulnerability of structures.

Participants self-sorted into the following three hazard working groups based on their expertise:

- Flood, Dam and Levee Failure, Drought
- Tornado, Severe Weather, Winter Storm
- Wildfire, Multi-Hazard

Each hazard working group examined the status of actions identified in the previously approved plan, actions identified in the brainstorming session by goal, and ideas for new actions for their respective hazards. Then, each working group discussed and refined a list of updated action alternatives for their hazards. The materials used during this process can be found in Appendix D: Mitigation Action Evaluation.

5.3 Prioritization and Implementation of Mitigation Actions

At their fourth meeting on May 19, 2009, the Planning Committee analyzed and prioritized the range of actions identified at the previous meeting. Before beginning the prioritization process, URS summarized the results of the hazard mitigation questionnaire (summary in Appendix C).

The Planning Committee discussed these results and used this information on stakeholder and public priorities in the prioritization process.

The previously approved plan did not provide information on how the 2003 actions were prioritized. The Planning Committee discussed and approved criteria for prioritizing the actions as part of the 2009 plan update process. Their criteria is based upon the STAPLEE method, which assesses the social, technical, administrative, political, legal, economic, and environmental implications of each action, but includes several modifications. Each identified actions was analyzed and ranked using the criteria defined in Table 5.3.

Table 5.3 Criteria for Prioritization

Criterion	Questions for Consideration
Structures Protected	What is the number and value of structures potentially protected by the action?
Life Safety Protected	Does the action prevent injuries and/or loss of life?
Administrative Capability	Does the community have the personnel and administrative capabilities to implement the action and maintain it or will outside help be necessary?
Technical Feasibility	Is the mitigation action technically feasible? Is it a long-term solution?
Public and Political Support	Is there overall public support for the mitigation action? Is there the political will to support the action?
Local Champion	Is there a strong advocate for the project among local departments/agencies or within the community who will support the action's implementation?
Economic Cost Benefit Review	Will the project be funded by current or future internal or external sources? Do the benefits, or losses avoided, of the action outweigh the costs?
Other Community Objectives	Does the action also further other community objectives, such as capital improvements, environmental quality, or open space preservation?

Source: Elbert County Hazard Mitigation Planning Committee

To make the prioritization process more time effective, the Planning Committee divided into two groups and divided the actions in half for analysis and ranking by discussion and consensus. The groups used the following scale, in which "High" (3) has the most potential benefits or likelihood for successful implementation:

- 3=High
- 2=Medium
- 1=Low

The total scores for each action were added up and written on wall paper for the entire group to review. Each Planning Committee member then considered the results of this ranking to vote on their top four priority projects. The results of the ranking by criteria and the voting are included in Appendix D.

Each jurisdiction used these results to develop a finalized list of prioritized mitigation actions specific to their jurisdiction. The number of the action in the mitigation action matrix on the following page indicated the general order of priority. Each jurisdiction developed and submitted a mitigation action implementation plan for each of their actions. The mitigation action implementation plans identified the following characteristics for each action or project:

- Action Title
- Background/Issue
- Ideas for Implementation
- Responsible Agency
- Partners
- Potential Funding Sources
- Cost Estimate
- Benefits
- Timeline

Table 5.4 summarizes the prioritized mitigation actions for all participating jurisdictions. The action implementation plans are included in Appendix B.

Continued Compliance with National Flood Insurance Program

Two jurisdictions—Elbert County and the Town of Kiowa—currently participate in the National Flood Insurance Program (NFIP). The Town of Simla has adopted a flood hazard prevention ordinance and is in the process of finalizing their participation with FEMA. Elbert County and Kiowa will continue participation in and compliance with the NFIP. Specific activities that the jurisdictions will undertake to continue compliance include the following:

- Working with FEMA and the State in the map modernization program and adopting new DFIRMs when effective (see Mitigation Action Kiowa—3)
- Improving coordination between planning, building, and road and bridge departments related to NFIP information and requirements (see Mitigation Action Elbert County—4)
- Improving education and outreach efforts about flood insurance and the County's floodplain management program

Table 5.4 Mitigation Action Matrix

No.	Mitigation Action Description	Hazard	Responsible Agency	Goals Addressed
Elbert County Actions				
Elbert—1	Convene Elbert County Hazard Mitigation Planning Committee semi-annually to monitor, evaluate, and update the hazard mitigation plan.	Multi-Hazard	Elbert County Office of Emergency Management	3) Future Development 4) Local Capabilities 5) Communication and Coordination
Elbert—2	Continue to pursue StormReady designation.	Severe Weather, Winter Storm, Tornado	Elbert County Office of Emergency Management	4) Local Capabilities 5) Communication and Coordination
Elbert—3	Establish a hazards and risk education campaign.	Multi-Hazard	Elbert County Office of Emergency Management	1) Education 4) Local Capabilities
Elbert—4	Improve coordination between community development, building, and road and bridge departments related to the National Flood Insurance Program (NFIP).	Flood	Elbert County Community and Development Services and Office of Emergency Management	3) Future Development 4) Local Capabilities 5) Communication and Coordination
Elbert—5	Incorporate hazard mitigation in Elbert County Master Plan update.	Multi-Hazard	Elbert County Community and Development Services	3) Future Development 4) Local Capabilities
Elbert—6	Identify and prioritize stormwater drainage system improvements.	Flood	Elbert County Road and Bridge Department and Public Health Department	2) Critical Facilities 3) Future Development
Elbert—7	Develop drainage/erosion control study or project coordinating objectives of various agencies for the Town of Elbert to reduce future flood damage.	Flood	Elbert County Road and Bridge	2) Critical Facilities 3) Future Development

No.	Mitigation Action Description	Hazard	Responsible Agency	Goals Addressed
Elbert—8	Protect historical community documents through digitization project.	Multi-Hazard	Elbert County Information Technology and Administrative Departments	2) Critical Facilities 4) Local Capabilities
Elbert—9	Develop special needs populations database inventory/registry.	Multi-Hazard	Elbert County Office of Emergency Management	1) Education 4) Local Capabilities 5) Communication and Coordination
Town of Elizabeth Actions				
Elizabeth—1	Implement stormwater drainage system improvements.	Flood	Elizabeth Public Works Department	2) Critical Facilities 3) Future Development
Elizabeth—2	Update stormwater ordinance.	Flood	Elizabeth Planning Department	3) Future Development 4) Local Capabilities
Elizabeth—3	Develop special needs populations inventory/registry.	Multi-Hazard	Elizabeth Police Department	1) Education 4) Local Capabilities 5) Communication and Coordination
Elizabeth—4	Implement water delivery system improvements.	Drought	Elizabeth Public Works Department	2) Critical Facilities
Town of Kiowa Actions				
Kiowa—1	Assess condition/level of protection of Kiowa levee and upgrade and maintain.	Flood, Dam/Levee Failure	Town of Kiowa	2) Critical Facilities
Kiowa—2	Mitigate flood risk to Kiowa schools.	Flood	Town of Kiowa	2) Critical Facilities
Kiowa—3	Participate in floodplain map modernization process with Elbert County and update flood damage prevention ordinance as needed.	Multi-Hazard	Kiowa Water and Planning	3) Future Development 4) Local Capabilities
Kiowa—4	Implement stormwater drainage system improvements.	Flood	Kiowa Street Department, Town Administrator	2) Critical Facilities 3) Future Development

No.	Mitigation Action Description	Hazard	Responsible Agency	Goals Addressed
Kiowa—5	Implement water delivery system improvements	Drought	Kiowa Utilities	2) Critical Facilities
Kiowa—6	Assess and designate shelters and distribute information to public/agencies.	Multi-Hazard	Town of Kiowa	1) Education 2) Critical Facilities 5) Communication and Coordination
Kiowa—7	Adopt a stormwater ordinance.	Flood	Town Administrator	3) Future Development 4) Local Capabilities
Kiowa—8	Develop education and incentives program to encourage water savings measures by citizens.	Drought	Town of Kiowa	1) Education 4) Local Capabilities
Kiowa—9	Assess protective measures needed for historic structures.	Multi-Hazard	Town of Kiowa	2) Critical Facilities
Town of Simla Actions				
Simla—1	Improve stormwater drainage system.	Flood	Simla Public Works	2) Critical Facilities 3) Future Development
Simla—2	Assess and designate shelters for tornado and blizzard victims.	Tornado Winter Storm	Simla Police Department	2) Critical Facilities
Simla—3	Obtain back-up generators for critical facilities.	Multi-Hazard	Simla Public Works and Water/Sewer Departments	2) Critical Facilities
Elizabeth Fire Protection District Actions				
Elizabeth FPD—1	Develop an Elbert County Wildfire Protection Program that includes public information, resources, and special events to reduce wildfire risk.	Wildfire	Elbert County Fire Chiefs Association	1) Education
Kiowa Fire Protection District Actions				
Kiowa FPD—1	Develop an Elbert County Wildfire Protection Program that includes public information, resources, and special events to reduce wildfire risk.	Wildfire	Elbert County Fire Chiefs Association	1) Education
Rattlesnake Fire Protection District Actions				

No.	Mitigation Action Description	Hazard	Responsible Agency	Goals Addressed
Rattlesnake FPD—1	Develop an Elbert County Wildfire Protection Program that includes public information, resources, and special events to reduce wildfire risk.	Wildfire	Elbert County Fire Chiefs Association	1) Education
Kiowa Conservation District Actions				
KCD—1	Form task force to improve coordination with conservation districts, assess condition of dams, and identify funding sources for repair and maintenance.	Dam and Levee Failure	Kiowa Conservation District, Double L Conservation District	5) Communication and Coordination
KCD—2	Minimize new development in dam inundation areas and educate public on flood control dam structures and easements.	Dam and Levee Failure	Kiowa Conservation District, Double L Conservation District, Elbert County Community Development Services	1) Education 3) Future Development

CHAPTER 6 PLAN MAINTENANCE

44 CFR Requirement §201.6(c)(4): The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

44 CFR Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

44 CFR Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

This chapter provides a formal process to ensure that the Elbert County Multi-Hazard Mitigation Plan Update 2009 will remain an active and relevant document. The plan maintenance process includes a method and schedule for all participating jurisdictions to participate in the process of monitoring, evaluating, and updating the plan. This chapter also discusses the incorporation of this plan into existing planning mechanisms and continued public involvement.

Plan Update: The previously approved plan did not identify plan maintenance procedures. Therefore, this plan update could not use the established process for updating or assessing the strengths and weaknesses of the previous plan's method and schedule for monitoring, evaluating, and updating the plan.

6.1 Monitoring, Evaluating, and Updating the Plan

Plan Monitoring and Evaluating

The Elbert County Hazard Mitigation Planning Committee (Planning Committee) discussed and approved the plan maintenance procedures described in this chapter at their final meeting. The Elbert County Emergency Manager (Emergency Manager) will serve as the primary point of contact and will coordinate all local efforts to monitor, evaluate, and update the plan. Each participating jurisdiction will be responsible for implementing their specific mitigation actions and reporting on the status of these actions to the Emergency Manager.

Throughout the year, the Emergency Manager will monitor the progress of mitigation efforts through site visits, phone calls and emails with the agencies responsible for mitigation actions. The Planning Committee agrees to meet semi-annually to evaluate the implementation of the Elbert County Multi-Hazard Mitigation Plan. This action is described in Mitigation Action Elbert County—1. The existing Elbert County Community Development Pre-Application Group meets weekly. Twice during the year these regularly scheduled meetings will be devoted to discussing the ongoing monitoring of the mitigation plan. The Emergency Manager will schedule this discussion on the agenda and invite members of the Planning Committee to attend.

The purpose of the meetings will be the following:

- Report on usefulness of the plan for each jurisdiction and their progress on mitigation actions
- Report on any input received from the public
- Discuss hazard events and observations
- Report on how the plan has been incorporated into other planning mechanisms
- Discuss mitigation issues and ideas
- Work to secure funding and identify multi-objective, cost-share, and other opportunities for partnerships
- Discuss how to keep the attention of community leaders and the public on hazard mitigation problems and opportunities
- Discuss new sources for data to improve future updates
- Make recommendations on specific updates to the plan

The Emergency Manager will email the Mitigation Project Progress Report (included in Appendix E) to each agency responsible for actions in the plan two weeks prior to the scheduled meetings. These progress reports serve as criteria by which the mitigation strategy may be evaluated. During the meeting, the group will review and discuss their progress and how they have utilized the plan.

Once a year, the Emergency Manager will also email the Mitigation Plan Annual Review Questionnaire to the Planning Committee and will summarize these reports into an annual Mitigation Plan Progress Report, which will be provided to the governing bodies of each participating jurisdiction. After considering the findings of the submitted progress reports, the governing bodies and or the Planning Committee may request that the implementing department or agency meet to discuss project conditions.

Plan Update Process

The Emergency Manager will initiate the five-year plan update process with the time necessary to ensure that the current plan does not expire before the updated plan is approved. The schedule will be sufficient to allow for the contracting for technical or professional services (if necessary); state and FEMA reviews; revisions, if necessary, based on FEMA review comments; and the adoption procedures of the participating jurisdictions. The Emergency Manager will coordinate the participation of the jurisdictions. The updated plan will meet FEMA's requirements and do the following:

- Consider changes in vulnerability due to action implementation
- Document areas where mitigation actions were or were not effective
- Incorporate new data or studies on hazards and risks
- Incorporate new capabilities or changes in capabilities
- Incorporate growth and development-related changes to inventories
- Incorporate new action recommendations or changes in action prioritization

The Planning Committee will also meet after a disaster to focus on the following items:

- Identify potential mitigation projects, particularly those eligible for mitigation grant programs if available
- Evaluate effectiveness of existing mitigation projects
- Reassess hazard profiles and vulnerability

Updating of the plan will be by written changes and submissions incorporated by the Elbert County Office of Emergency Management and as approved by the Elbert County Board of Commissioners and the governing boards of the participating jurisdictions.

6.2 Incorporation into Existing Planning Mechanisms

The Elbert County Emergency Manager, with support and guidance provided by the Planning Committee, will work with the responsible agencies to incorporate this plan into the following existing planning mechanisms:

- Elbert County Master Plan
- Elbert County Emergency Operations Plan
- Master plans of the other participating jurisdictions
- Zoning, subdivision, and floodplain ordinances
- Weekly meetings of the Elbert County Community Development Pre-Application Group
- Capital improvement plans and county and municipal budgets
- Other plans and policies outlined in the capability assessment

The previously approved plan identified the need for Elbert County, Elizabeth, and Simla to join the National Flood Insurance Program (NFIP). Elbert County and the Town of Silma joined the program. The Town of Elizabeth is considering joining in the future. Elbert County adopted a flood damage prevention ordinance and implemented a floodplain management program. The previously approved plan did not identify other methods for incorporating the mitigation plan into other planning mechanisms and the Planning Committee did not identify other examples of this occurrence.

Elbert County documented its intention to incorporate information from the multi-hazard mitigation plan into updates of the Elbert County Master Plan in mitigation action Elbert County—5. The Town of Kiowa documented its intention to incorporate hazard criteria into the development review process in mitigation action Kiowa—4. Additionally, relevant priority actions of the Elbert County Master Plan and development review process may be incorporated into future updates of the hazard mitigation plan, as appropriate. The process for incorporation of plan elements into existing planning mechanisms will be according to the rules and regulations of the governing jurisdiction. Typically, the Emergency Manager will meet with and support the staff of the department responsible for drafting the plan document or conducting the planning program to ensure the relevant elements of this plan are taken into consideration.

6.3 Continued Public Involvement

The Planning Committee is committed to identifying additional opportunities to raise community awareness about the plan and mitigation efforts in Elbert County. The plan document will be posted on the webpage of the Elbert County Office of Emergency Management. The website will contain an e-mail address and phone number to which people can direct their comments or concerns.

The Emergency Manager will present an update of the plan's progress at a regularly scheduled meeting of the Elbert County Board of County Commissioners on an annual basis following the plan progress meeting of the Planning Committee. This meeting will be open to the public and notice will be provided according to Elbert County regulations. The Emergency Manager will extend invitations to governing boards of participating jurisdictions to attend this meeting two weeks prior.

The Emergency Manager and other members of the Planning Committee will also identify opportunities to raise community awareness about the plan and the hazards that affect the participating jurisdictions. This effort could include attendance and provision of materials at county, municipal, and school-sponsored events, activities of the fire protection districts, through the Red Cross, and public mailings.

Any public comments received about the plan will be collected by the Emergency Manager and included in the Annual Plan Progress Report. During the plan update process, the Emergency Manager will develop a schedule for the public to submit comments to be considered for incorporation into the plan, as appropriate. All public comments will be attached as an appendix to plans that are submitted for approval by the State and FEMA.