



Turning Risk into Reward: Hazard Risk Reduction

COSA Conference, Breckenridge
September 18, 2017



PLANNING FOR HAZARDS
Land Use Solutions for Colorado

Overview

- **Planning for Hazards: Reducing Risks through Open Space**
Anne Miller, Colorado Department of Local Affairs
 - **Colorado Springs Case Study**
David Deitemeyer, City of Colorado Springs
 - **Communicating Multiple Benefits**
Anne Kuechenmeister, Michael Baker International
 - **Resources**
 - **Discussion / Q & A**
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Planning for Hazards

Anne Miller, Colorado Department of Local Affairs

Introduction

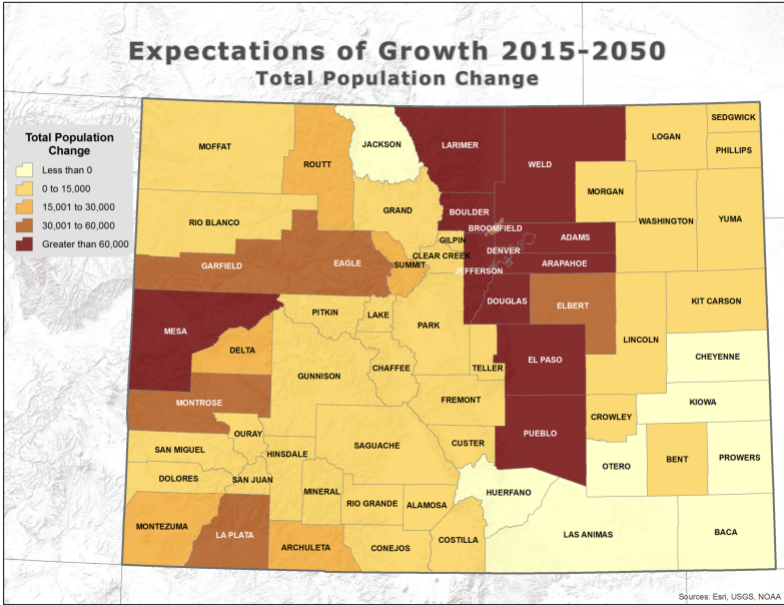
- Colorado is growing
- Colorado is no stranger to natural hazards ... and they are increasing in frequency and severity
- Every Colorado community faces vulnerabilities to shocks and stresses
- We can build community resilience by reducing risk and vulnerability



Source: [The Denver Post](#)



Source: [News Deeply](#)



8.6 million by 2050 (from 5.4 M in 2015) // Fastest growth between now and 2025



General Principles

- ▶ Prevent development in hazardous areas
- ▶ Direct future growth to safer areas
- ▶ Strengthen existing regulations and development in hazardous areas

Avoidance

The most effective way to protect development from hazards is simply to prohibit development in known hazard areas.

Preserving open space & natural resources provides multiple benefits – it is key to a sustainable future.



Interrelatedness of Hazards

- Drought → Fire
- Lightning → Fire
- Fire → Flooding
- Fire → Debris Flow
- Flooding → Soil Hazards



Preservation and management of open space counts.



Planning for Hazards – A Collaborative Approach

- ▶ Parks and open space staff
- ▶ Land use planners
- ▶ Emergency managers
- ▶ Elected and appointed officials
- ▶ Public works officials
- ▶ Community advocates
- ▶ Business owners
- ▶ Developers
- ▶ Citizens



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www.planningforhazards.com

Purpose of the Guide

Learn how the Hazard Mitigation Guide can help your community address risks and integrate hazard mitigation into policies, regulations, and standards.

Intro

This guide provides detailed, Colorado-specific information about how to assess a community's risk level to hazards and how to implement several land use planning tools and strategies for reducing a community's risk.

Read the Guide

To explore this guide or specific chapters in the traditional format, Page-by-Page from start to finish, look for the purple Table of Contents on the top right and the previous/next buttons on the bottom of each page.

Content:

- ▶ Introduction and Summary
- ▶ Planning Framework
- ▶ Hazard Identification and Risk Assessment
- ▶ Planning Tools and Strategies
- ▶ Moving Forward
- ▶ Appendix – Hazards in Colorado

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MARCH 2016

The Hazards Lineup



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Addressing Hazards in Plans and Policies Comprehensive Plan

Strengthening Resilience Climate Plan

Protecting Sensitive Areas Community Wildfire Protection Plan (CWPP)

Improving Site Development Standards Hazard Mitigation Plan

Improving Buildings and Infrastructure Parks and Open Space Plan

Enhancing Administration and Procedures Pre-Disaster Planning

Share the Guide

This guide was recently featured in a USACE Silver Jacke guide in your networks to

Introduction

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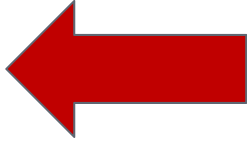
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Planning Tool Profiles

ADDRESSING HAZARDS IN PLANS AND POLICIES
Integrating Risk Reduction into Comprehensive Plans
Climate Plan
Community Wildfire Protection Plan (CWPP)
Hazard Mitigation Plan
Parks and Open Space Plan
Pre-Disaster Planning (COOPs, COGs, and PDRPs)
STRENGTHENING INCENTIVES
Community Rating System
Density Bonuses
Development Agreements
Transfer of Development Rights
PROTECTING SENSITIVE AREAS
1041 Regulations
Cluster Subdivisions
Conservation Easements
Land Acquisition
Overlay Zoning
Stream Buffers and Setbacks

IMPROVING SITE DEVELOPMENT STANDARDS
Low-Impact Development and Stormwater Management BMPs
Site-Specific Assessments
Subdivision and Site Layout Standards
Use-Specific Standards in Zoning Regulations
IMPROVING BUILDINGS AND INFRASTRUCTURE
Building Code
Critical Infrastructure Protection
WUI Code
ADMINISTRATION AND PROCEDURES
Application Submittal Requirements
Post-Disaster Building Moratorium





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Land Use Tool: Overlay Zoning

On This Page

- [How It Works](#)
- [Implementation](#)
- [Where It's Been Done](#)
- [Advantages and Key Talking Points](#)
- [Challenges](#)

How It Works



Glenwood Springs

Overlay zoning is used by communities to apply area-specific standards and/or conditions. A base zoning district (such as residential or mixed-use) determines the types of uses permitted, the dimensional requirements, and sometimes additional district-specific standards. An overlay district (or overlay zone) is an additional layer of standards that apply to all areas within a defined overlay boundary, regardless of the underlying base zoning district. For example, an area with single-family homes that is zoned R-1 might also be within a hillside overlay zone. In this example, the permitted uses might allow construction of a

Model Codes & Regulations

Learn More

Hazards Addressed

- Flood
- Wildfire

PDF

Download PDF

See all PDFs

Key Facts

Administrative Capacity - Experienced planner

Parks & Open Space Plans



▶ Frederick

- Open space inventory includes floodplains and drainage areas

▶ Teller County

- Maps “Environmental Hazard Areas” - steep slopes, floodplains, geologic hazards – to identify open land for protection
- Links open space planning with Multi-Hazard Mitigation Plan

▶ Durango

- “Greenprinting” map to identify high value areas for protection, including public safety



Best Practice:

Avoid Development in High Hazards Areas

Most effective tools:

- ▶ Transfer of development rights
- ▶ Cluster subdivision
- ▶ Conservation easements
- ▶ Land acquisition
- ▶ Overlay zoning
- ▶ Stream buffers and setbacks
- ▶ Subdivision and site design standards



Land Acquisition & Conservation Easements

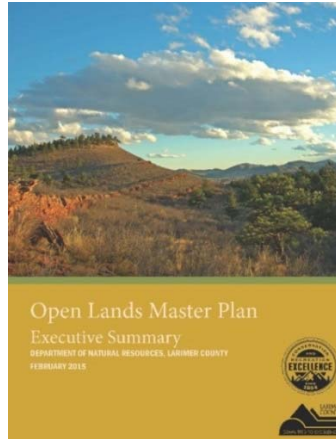


Larimer County

- ▶ Quarter cent “Help Preserve Open Space Tax” to maintain & expand open space – 43,000+ acres since 1995
- ▶ River corridor conservation a priority

Routt County – Purchase of Development Rights Program

- ▶ Preserving natural areas and agricultural lands since 1996



Stream Buffers & Setbacks



Examples:

Aspen/Pitkin County, Estes Park, Fort Collins, San Miguel County

- ▶ Purpose
 - Avoid development in flood hazard area and prevent property loss
 - Protect hydrologic, biological, ecological, aesthetic, recreational, and educational functions
- ▶ Approaches
 - Fixed or variable setbacks
- ▶ [Model code](#)



Putting the Guide into Action

- ▶ Implementation pilot project underway with 2 pilot communities
 - Manitou Springs
 - Milliken
- ▶ Facilitator and participant workbooks available for 6 work-sessions to plan for hazards



Materials Available to Communities

Work Session 2 - Handout 1 Identifying Community Assets

This handout should be used to identify community assets when preparing the plan.

Category	Examples	Our Community
General Facilities, Infrastructure, and Assets	Police, fire, emergency services	
Water	Public drinking water supply	
Emergency Services	Police, fire, emergency services	
Communications	Telephone lines, cell towers	
Utilities	Electric, gas, water, sewer	
Hospitals and Health Care	Hospitals, urgent care facilities	
Food/Beverage	Restaurants, grocery stores	
Transportation	Major roads, bridges, bus routes	
Business	Ware and other financial institutions	
Government Agencies	City hall, schools, police, military	
Religious Sites	Churches, synagogues, mosques	
Community	Neighborhood associations	
Technology	Mobile phone plans, landline	
Historical Sites	Historical landmarks, museums	
Chemical Facilities	Chemical plants, refineries	
Defense Industry	Defense contractors, military bases	
Construction	Construction companies, contractors	
Public Works	Public works departments, utilities	
Manufacturing or Trade	Manufacturing plants, trade associations	
Public Safety	Police, fire, emergency services	
Healthcare	Hospitals, clinics, pharmacies	
Cultural Assets	Museums, historical sites, cultural organizations	
Community Assets	Neighborhood associations, community groups	

Agenda - Work Session 3 Assessing Capabilities and Developing Planning Strategies

Topic	Duration
Assessing Capabilities	45 minutes
Developing Planning Strategies	60 minutes

OUR NEXT WORK SESSION:
 The Planning for Hazards guide - pp. 21-22
 Task 6: Subsections on evaluation criteria and action
<http://www.colorado.gov/pacific/ehp/20130726-18-10-24.pdf>



Colorado Springs Case Study

David Deitemeyer, Park Planner II

Colorado Springs

*“General Palmer’s plan for a park system was bold, far-sighted and comprehensive. He sought to surround the city with **near-by parks**, mountain driveways, **woodland paths**, and trails; to furnish places for healthful **out-door exercise**, and **quiet restful enjoyment**.”*

-Report of the 1908 Parks Commission



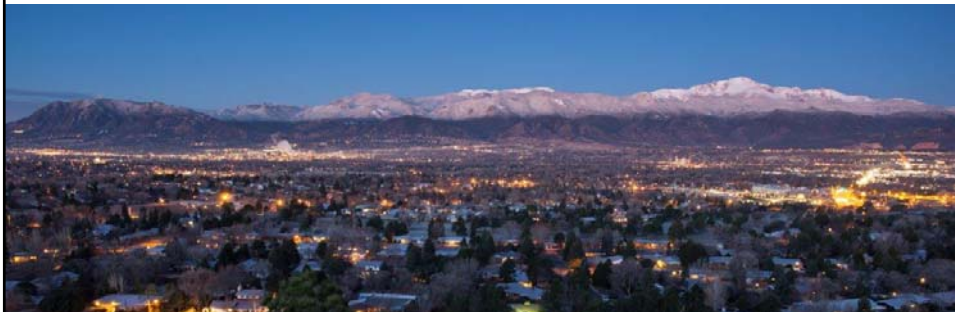
Colorado Springs Parks System

- ▶ **450,000** Population
- ▶ **145** Neighborhood Parks
- ▶ **7** Regional Parks
- ▶ **146** Miles of Urban Trails
- ▶ **49** Open Space Areas
- ▶ **5** Community Centers
- ▶ **2** Golf Courses
- ▶ **198,000** Park Trees
- ▶ **3** Disc Golf Courses
- ▶ **2** Cemeteries
- ▶ **1** 14,115' Mountain
- ▶ **130** Playgrounds
- ▶ **3** Sports Complexes
- ▶ **90** Pieces of Public Art
- ▶ **14,000** acres of Open Space
- ▶ **1** Museum
- ▶ **1** Indoor Ice Rink
- ▶ **148** Outdoor Sport Courts



Natural Hazards in Colorado Springs

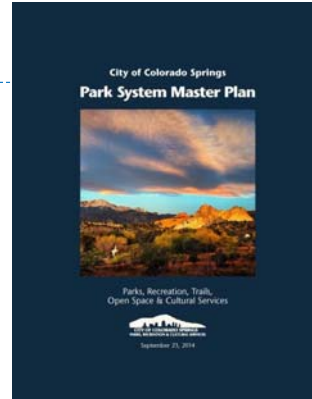
- Winter Storms/Blizzards
- Wind/Hail/Lightning
- Plague of Insects
- Floods
- Wildfire – Significant Wildland Urban Interface (WUI)
- ¼ the City in WUI = 35,360 residential parcels



Addressing the Hazards

2014 Parks System Master Plan

- Address Floods, Fires and Drought:
 - Management Plans, Partnerships, Strategic Design and Planning of Trails and Facilities
- Open Space Acquisition:
 - Protection of environmental features, habitat, significant vegetation, protection of visual resources, and provision of recreational and educational opportunities.



Forest Restoration and Management

- ▶ Trails, Open Space and Parks (TOPS) sales tax and partnerships
- ▶ Science-based treatments and prescriptions
- ▶ Forest restoration project at the landscape scale
- ▶ Balancing the goals and values of the entire population



Forest Restoration and Management

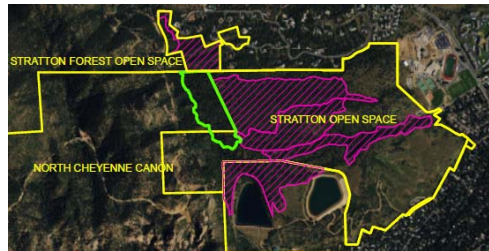
Improve forest health

- ▶ Reduce basal area
- ▶ Stand structure
- ▶ Reduce the dead and diseased trees
- ▶ Remove latter fuels
- ▶ Improve species diversity
- ▶ Stand age variation
- ▶ Invasive removal
- ▶ Improve fire fighter safety
- ▶ Keep fires smaller in size and lower the fire intensity



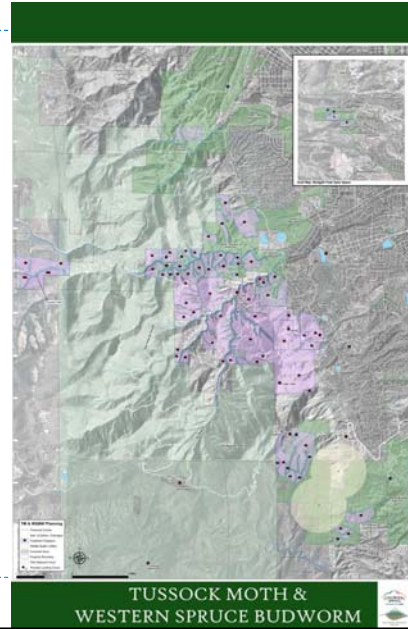
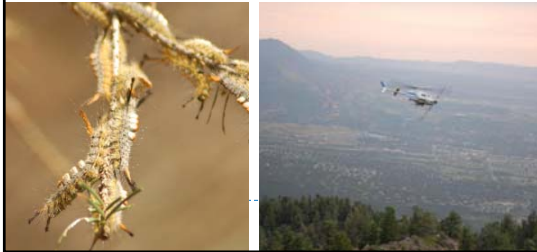
Partnerships

- Collaborative Projects throughout the City
 - Increased funding
 - Larger scale projects
 - Grant opportunities
 - Adjacent Property Owners
 - Maximize Successful Project Goals and Outcomes



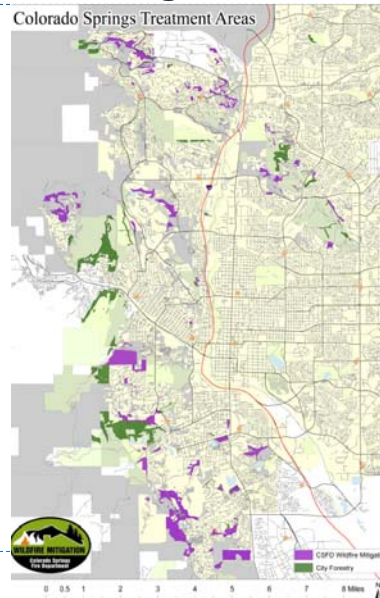
Forest Management

- Insect Infestation 15,000+ acres
 - Aerial treatment of 4,000 acres
- Partnership with landowners critical
 - Private and Public Lands treated
- Mitigate impacts to forest health
 - Fuel loading in the forest
 - Water quality impacts



Wildfire Mitigation/Forest Management

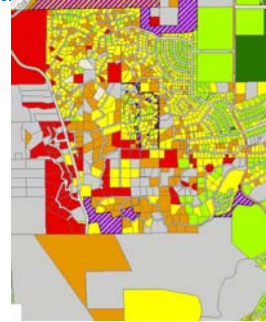
- City Forestry
 - 1,500 acres treated
 - 20 Parks and Open Spaces
- CSFD Wildfire Mitigation
 - 2,500+ acres
 - 36,485+ homes
- Collaborative Projects
 - Open Spaces
 - Parks
 - Neighborhoods
 - Utility Infrastructure



Wildfire Mitigation Colorado Springs

Fire Department lead initiative to promote wildfire mitigation

- Hazard Risk Analysis
- “Sharing the Responsibility”
- Create awareness for WUI communities
- Deliver mitigation information/education to reduce risk to homeowners, HOA's, Businesses and Landowners
- Neighborhood Chipping Program



Case Study: Cedar Heights Community

- High Fire Risk Community
- Pre-disaster mitigation grants from FEMA
 - Common-owned open spaces near residential areas and critical infrastructure \$2.8 million
- Fire Mitigation around the Cedar Heights
 - \$300,000 for the losses-avoided value of \$75 million
- Private Solitude Park - 295 AC open space (conservation easement)





“We knew the mitigation we’d done would change the fire behavior, but until it actually happened and we could see it - holy cow! The fire blackened right up to the mitigation area and ran out of fuel. So we were able to defend Cedar Heights.”

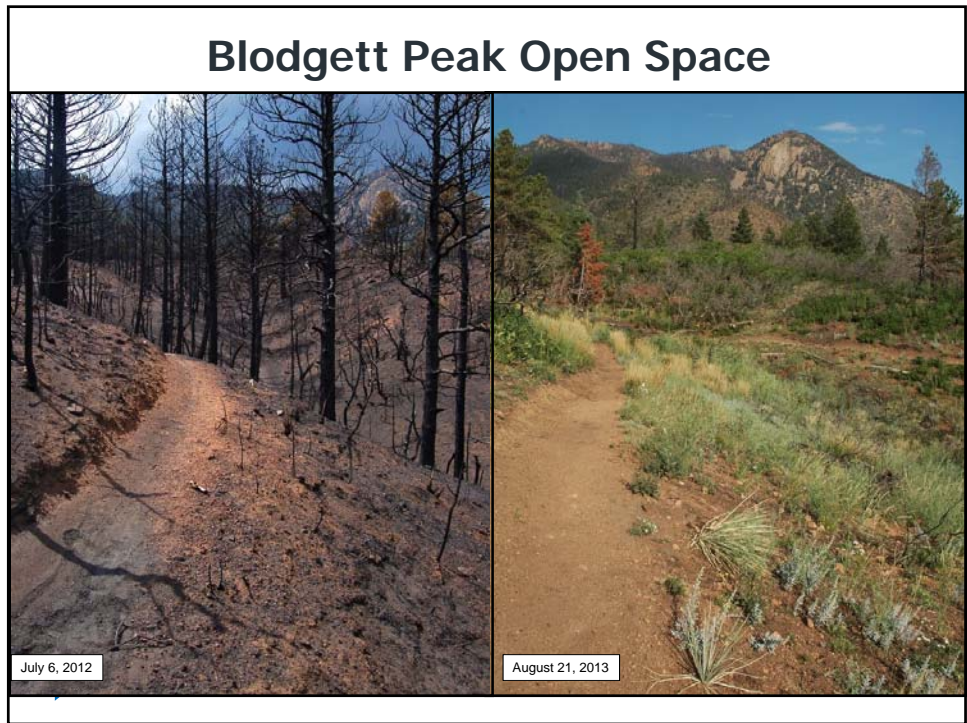
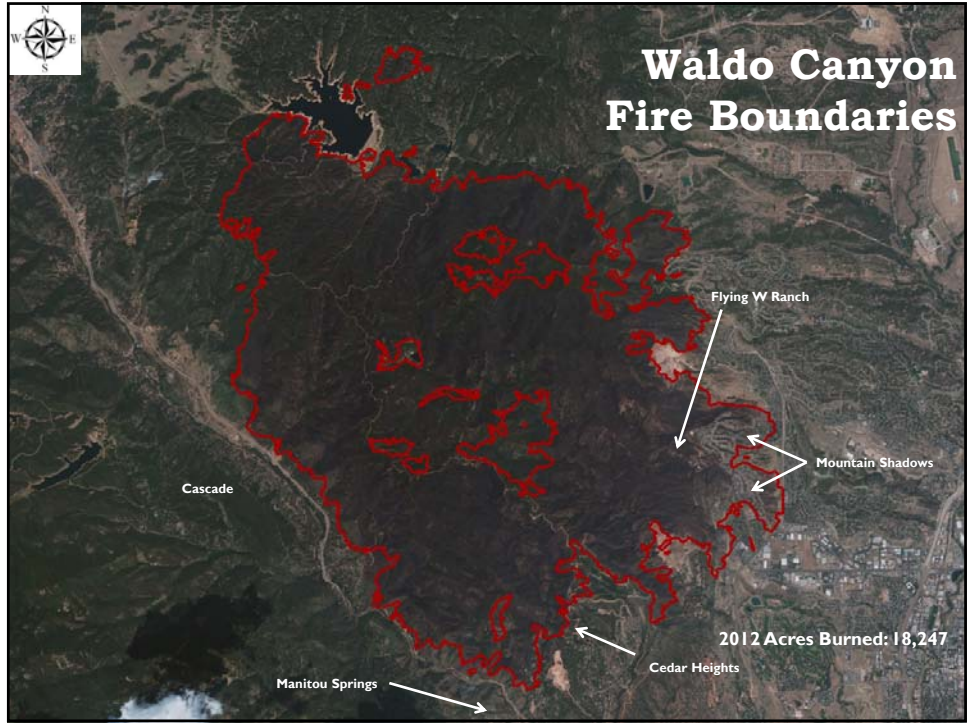
Andrew Notbolhm -- Former Colorado Springs Fire Department Wildland Fuels Program Coordinator



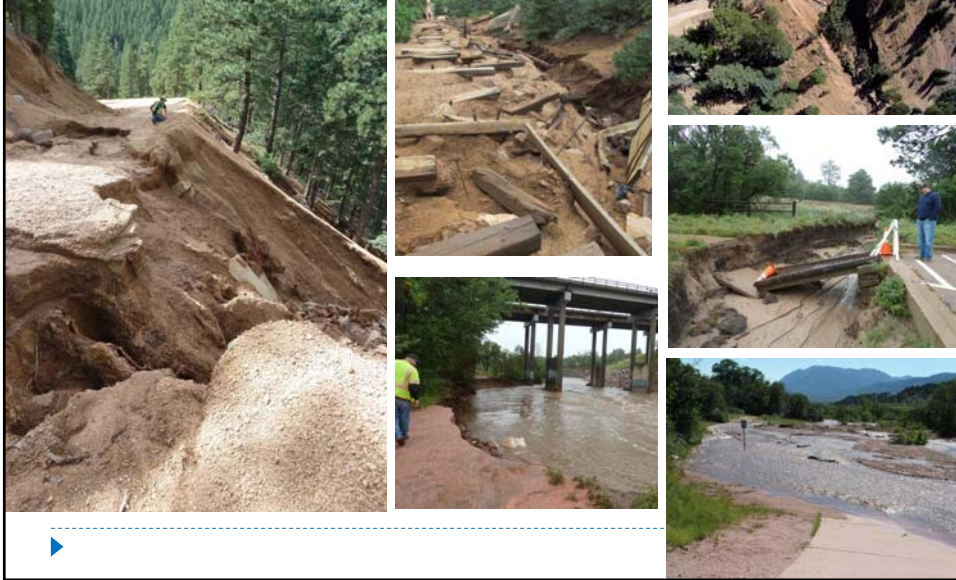
Waldo Canyon Fire

- ▶ **June 23 – July 10, 2012: (Federal Disaster DR-4067)**
- ▶ Two people killed
- ▶ 347 Homes Destroyed
- ▶ 18,247 acres burned in El Paso County, Pike National Forest, and City of Colorado Springs
- ▶ Type I Team Response (Great Basin Team)
- ▶ Flying W Ranch destroyed
- ▶ Over 32,000 people evacuated





Problem? What Problem?



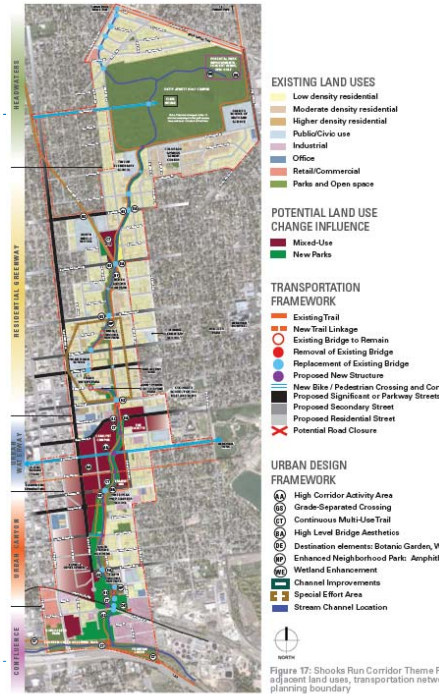
Hazard Mitigation

- Proactive Approaches
- FEMA Flood Repair Projects
 - Opportunities for Mitigation Funding
- Mt. Manitou Incline
 - Infrastructure Protection
 - Disaster Resiliency
 - 2 of 3 Phases funded by pre-disaster grants



Envision Shooks Run

- Master planning of the creek corridor east of Downtown
- Multi-modal transportation and drainage infrastructure study
 - Manage and improve aging and undersized infrastructure
 - Identify funding to address issues
 - Community guidance on how to accomplish
 - EnvisionShooksRun.com



Envision Shooks Run



Resilience Action Partners

- ▶ FEMA contract focused on community engagement and risk communication
- ▶ What does that mean?
 - ▶ Hazard mitigation and risk analysis technical expertise
 - ▶ Innovative communication and engagement strategies to talk about hazards, risks, and solutions
 - ▶ Communication and FEMA program training



High Water Mark

- ▶ Training
- ▶ Visual materials
- ▶ Communication products
- ▶ Virtual Reality: Immersed



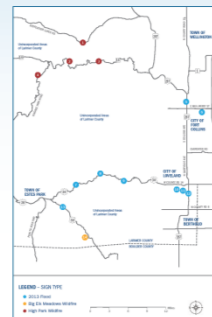
LARIMER COUNTY A HISTORY OF DISASTER SURVIVAL

In Larimer County, we always strive to strengthen our communities' ability to thrive in the face of disaster. Learning from our history with disasters in the northern Front Range and understanding the risk we all face is crucial to thriving and protecting our way of life. The spots on this map tell the story of three memorable disasters in recent history. Signs at each location now serve as reminders of the devastation our residents survived and our community's resolve to build back, stronger than before.

High Park Wildfire
A single lightning strike on June 9, 2012 ignited the High Park Wildfire that claimed the life of one Larimer County resident and destroyed 250 buildings. The wildfire burned 87,284 acres before we rekindled it on June 30, 2012. Impacted communities were under evacuation for 21 days but we felt the consequences of the fire for the next several years. The burn scars set the conditions for even greater destruction during the 2013 flooding disaster.

- Rocky Lake, Gause View Mountain Wild near State 1
- Narrows Campground off Poudre Canyon Road
- Young's Gulch Campground off Poudre Canyon Road
- CR 63E Pingree Park

HIGH WATER MARK SIGN LOCATIONS



Larimer County Floods of 2013
Just a year after the High Park wildfire in 2012, Colorado witnessed the deadliest flood in Centennial state history. Larimer County residents were pummeled by a year's worth of rain in the span of just five days. The water demolished both Highway 34 and 36 rendering them impassable. Both the Big and Little Thompson Rivers swelled over their banks, isolating communities and forcing swift evacuation of mountain residents. In all, the catastrophic floods claimed 10 lives and 47 homes.

- Poudre River Trail at Fort Collins Museum of Discovery
- Poudre River Trail north of Prospect Road near Centennial Center of the Rockies
- Sleepy Hollow Campground off US Highway 34
- Fork's Park or River Fork
- Loveland - Veterans-Smith Mountain Park (Future)
- Loveland - Blue Path East of Ft. Wilson Ave.
- Loveland - River's Edge Natural Area
- Loveland - Fairgrounds Park
- Hermit Park Campground off of US Highway 36

Big Elk Meadows Wildfire
A hot part from a passing car was the spark of the Big Elk Meadows Wildfire in July of 2002. The fire lasted six days, burning 4,623 acres. One barn succumbed to the flames, but firefighters saved 650 structures threatened by the fire. Tragically, three of those firefighters lost their lives in the blaze.

- CR 47 approximately 1/2 mile from US Highway 36



Education & Awareness: High Water Mark



<https://www.fema.gov/high-water-mark-initiative>

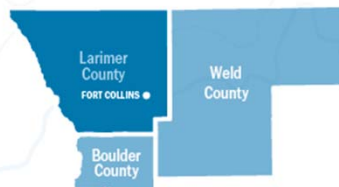


Design: Green Infrastructure

FORT COLLINS, COLORADO

Larimer COUNTY 156,480 POPULATION

Poudre River Acquisition Projects and Open Space Preservation MITIGATION SUCCESSES



During the flood of September 2013, the Poudre River experienced flows equal to a 50-year event. However, the community experienced very little flood damage. In the decades prior to the 2013 storm, the City of Fort Collins preserved open space and acquired high-risk structures along the Poudre River corridor as part of a Willing Seller-Willing Buyer program. The parkland along the river absorbed the impacts of the storm and slowed the flow and spread of the water.

Resources

Anne Kuechenmeister, Michael Baker International

Hazard Mitigation Assistance Funds

What is it for? Several funding sources under this umbrella, all to reduce flood risk.

Who is eligible? States, U.S. territories, federally-recognized tribes, local governments (who can also sponsor applications on behalf of homeowners).

What else should I know? You have to have a current Hazard Mitigation Plan (HMP) and the project or planning effort should be consistent with this plan.

<https://www.fema.gov/pre-disaster-mitigation-grant-program>



Pre-Disaster Mitigation Grant Program (PDM)

What is it for? Implementing pre-disaster natural hazard mitigation to reduce risk to the population and structures, while also reducing reliance on Federal funding. Grants for planning and projects.

<https://www.fema.gov/pre-disaster-mitigation-grant-program>



Flood Mitigation Assistance (FMA) Grant Program

What is it? Funding for projects or planning to eliminate the long-term risk of flood damage to structures insured by the National Flood Insurance Program (NFIP). Funds are also available for management costs.

<https://www.fema.gov/flood-mitigation-assistance-grant-program>



Mitigating Flood & Drought Conditions Under HMA

Pre-Application

1. Initial Study (i.e., concept)
2. Engineering Analysis
3. Proposed Design and Costs

Application Tips

1. Establish a need with studies, taking land out of the floodplain, demonstrating shovel ready
2. **Return on Investment (ROI):** If there are no historical or anticipated damages to the area, ROI can't be established. BUT if you buy adjacent properties, this can roll into the ROI. Purchasing land or demonstrating a long documented history of hazard impacts can help reach necessary ROI.

▶ <https://www.fema.gov/media-library/assets/documents/110202>

Questions & Discussion





Thank You



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