

WILDFIRE READY WATERSHEDS

STATEWIDE POST-FIRE SUCEPTIBILITY

Program Update December 2022



COLORADO

Colorado Water
Conservation Board

Department of Natural Resources



Wildfire Ready Watersheds

MISSION

The CWCB will assess the susceptibility of Colorado's water resources, communities and critical infrastructure to post-wildfire impacts and advance a framework for communities to plan and implement mitigation strategies to minimize these impacts – before wildfires occur.

Legislative directive from SB21-240



Wildfire Ready Watersheds



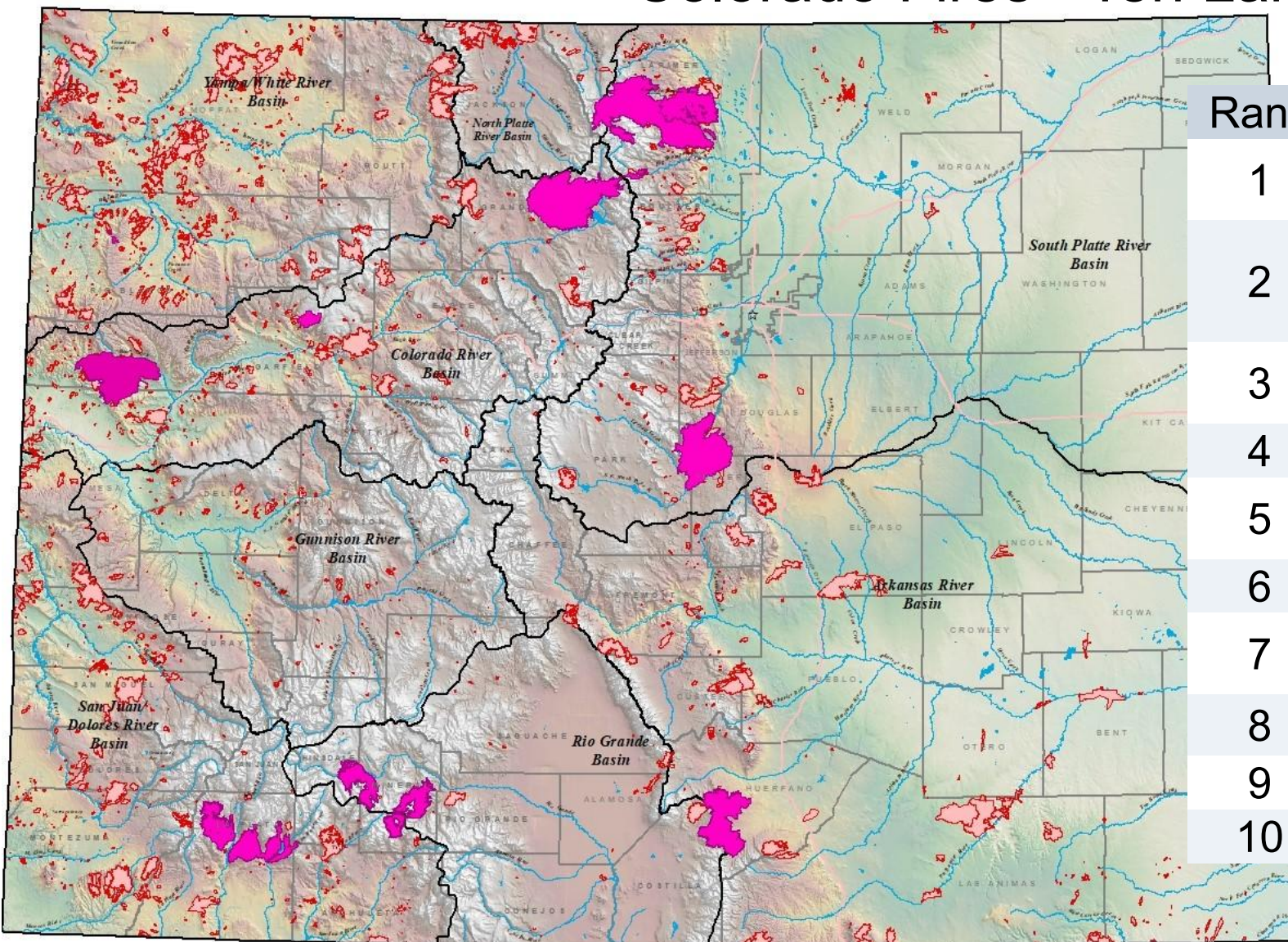
Healthy Forested Watersheds:

- Maintain flow regimes at historic conditions
- Are able to resist, absorb, and recover from natural hazards (Resilience)
- Provide high quality water supply for agriculture, municipal, and environment
- Provide diverse and complex habitat features in upland and riverine environments



Wildfire Ready Watersheds

Colorado Fires - Ten Largest



Rank	Fire	Acres	Year
1	Cameron Peak	208,913	2020
2	East Troublesome	193,812	2020
3	Pine Gulch	139,007	2020
4	Hayman	137,760	2002
5	Spring Creek	108,045	2018
6	High Park	87,284	2012
7	Missionary Ridge	70,285	2002
8	West Fork	58,570	2013
9	416	54,129	2018
10	Papoose	49,628	2013



Wildfire Ready Watersheds

COMPONENTS

**STATEWIDE
SUSCEPTIBILITY**

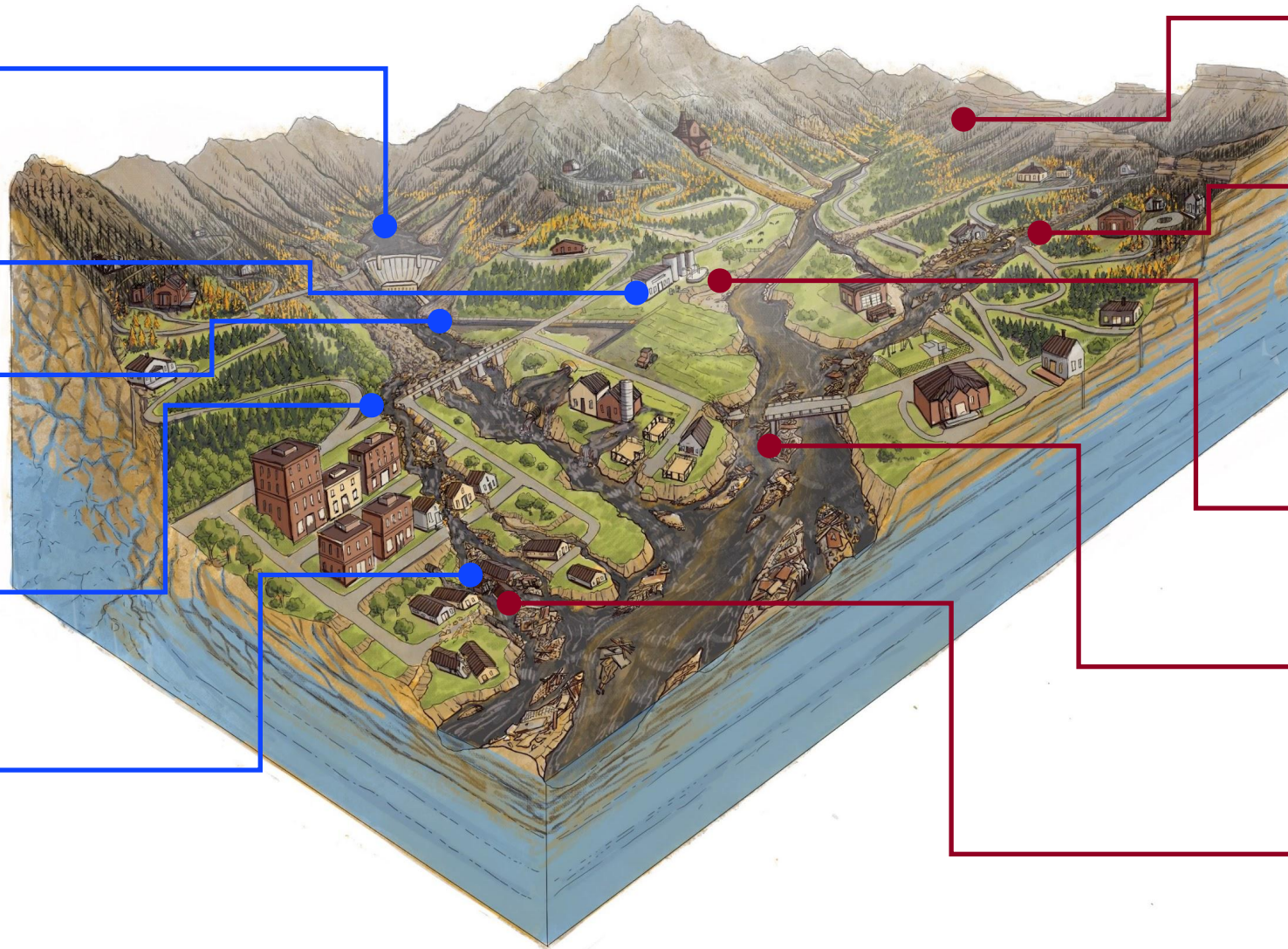
**FRAMEWORK
FOR
COMMUNITIES**



Wildfire Ready Watersheds

VALUES AT RISK

- Reservoirs and Dams
- Municipal Water Intakes
- Ag Water Infrastructure
- Road Crossings
- Life and Property



HAZARDS

- Hillslope Erosion
- Debris and Mud Flows
- Water Quality Degradation
- Riverine Erosion & Sedimentation
- Flooding



Wildfire Ready Watersheds

VALUES AT RISK

Values at Risk Data Sets

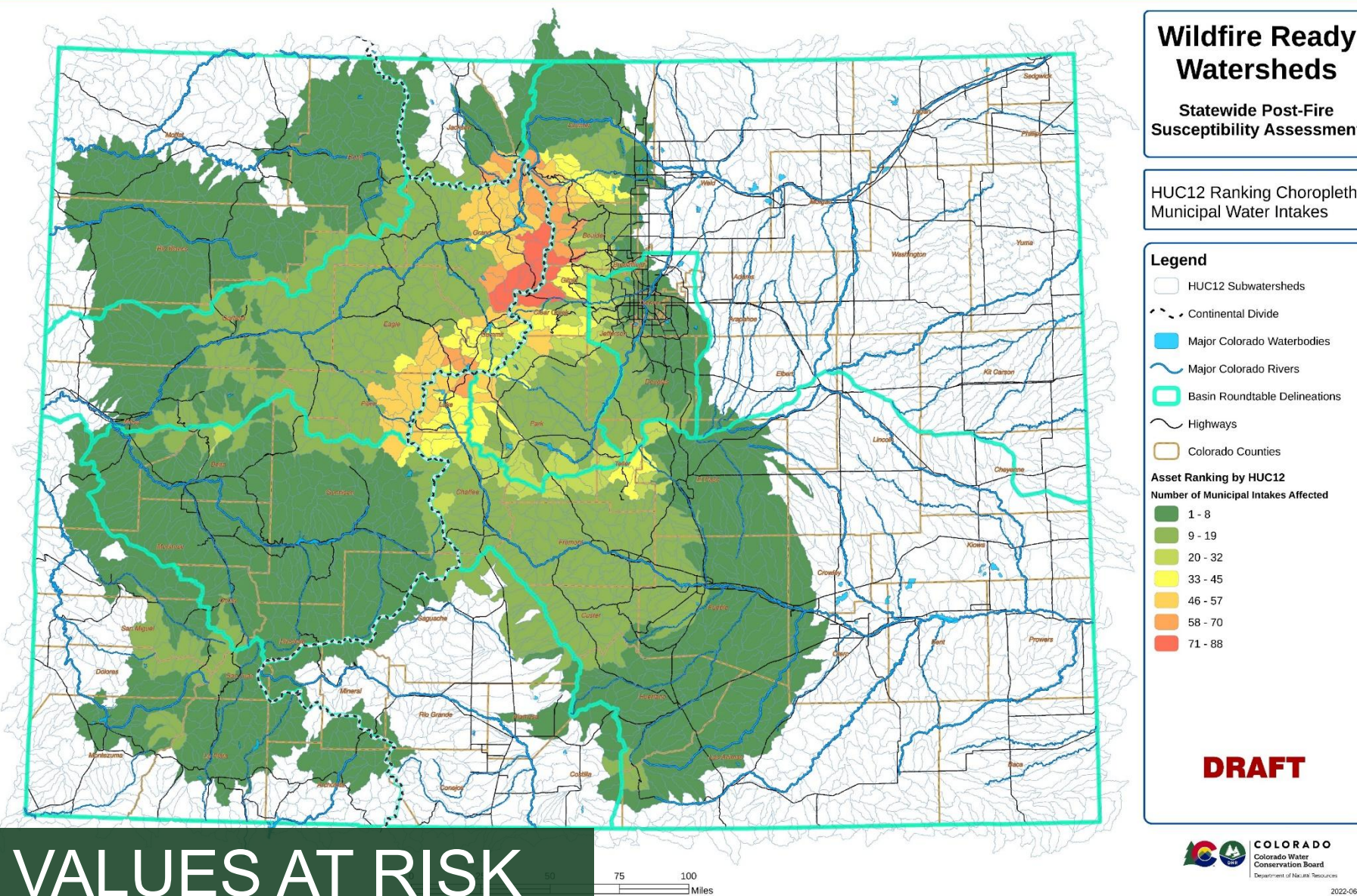
- These data sets represent the presence and number of assets within any given watershed (HUC12).
- Many of the watersheds (HUC12) shown are not at risk for wildfires that would generate high burn severity resulting in significant post-fire hazards.
- The asset layers form the foundation for the intersection with post-fire hazards.



Wildfire Ready Watersheds

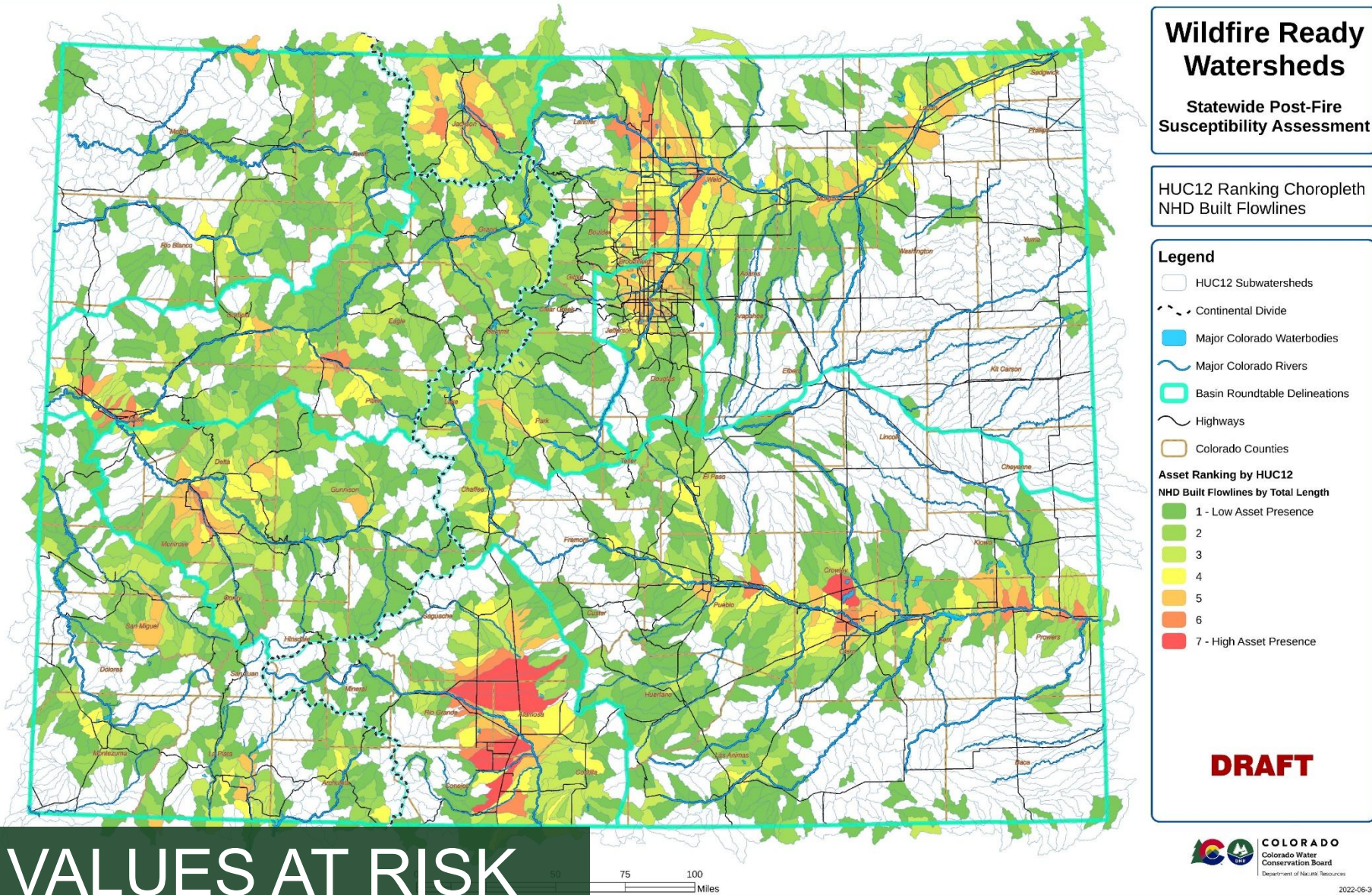
Source Water

Evaluates the number of water suppliers that rely on any given watershed.





Wildfire Ready Watersheds



Built Flowlines

Built diversion infrastructure within a watershed.

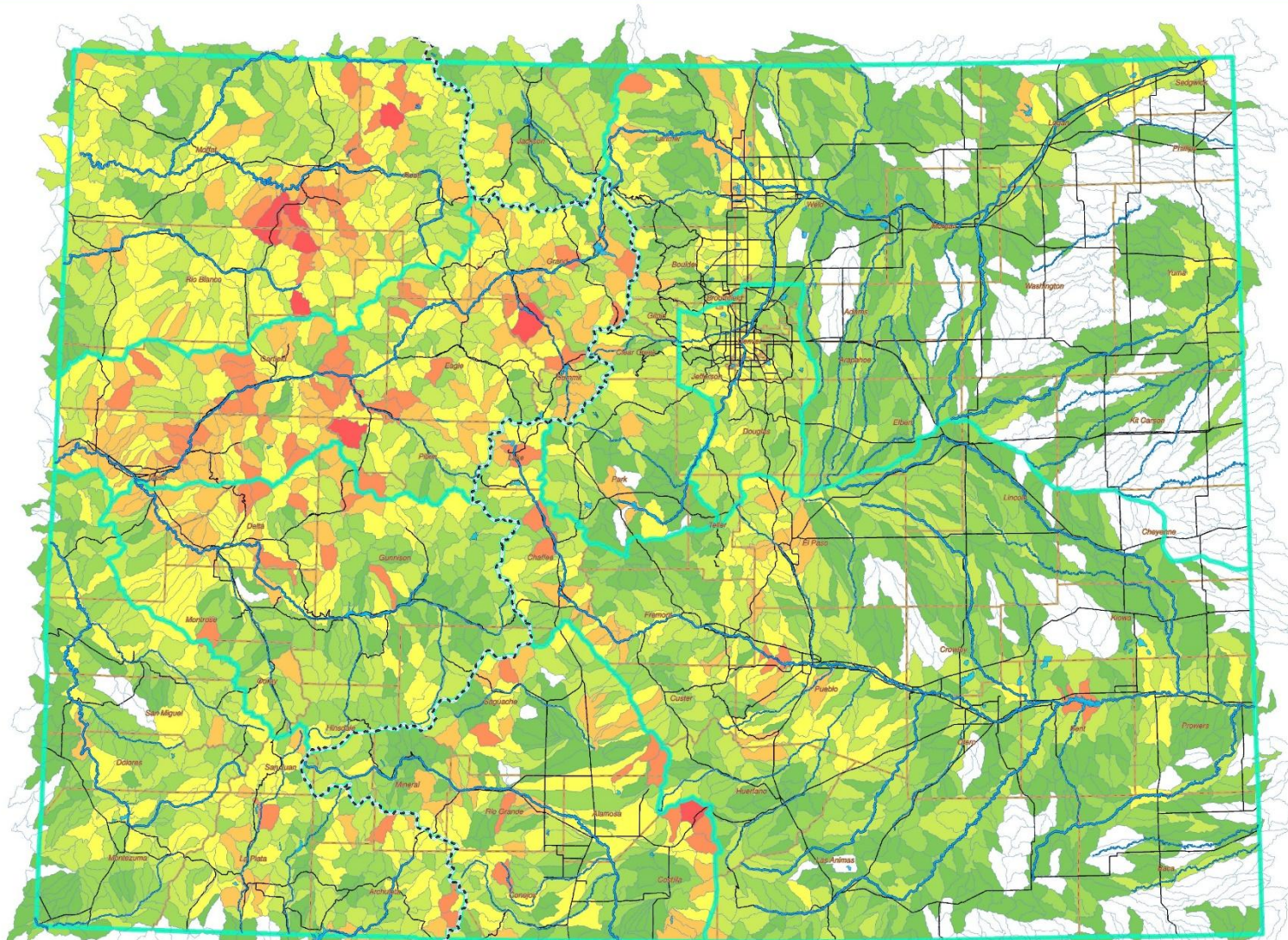
Evaluates the length of Conveyance ditches by HUC.

Indicates where burned basins could affect downstream water users.

VALUES AT RISK



Wildfire Ready Watersheds



Wildfire Ready Watersheds

Statewide Post-Fire
Susceptibility Assessment

HUC12 Ranking Choropleth
CPW Aquatic Resources

Legend

- HUC12 Subwatersheds
- Continental Divide
- Major Colorado Waterbodies
- Major Colorado Rivers
- Basin Roundtable Delineations
- Highways
- Colorado Counties

CPW Aquatic Resources

Combined CPW Aquatic Resources

- 1 - 3
- 4 - 5
- 6 - 7
- 8 - 10
- 11 - 13
- 14 - 17
- 18 - 21

DRAFT

Aquatic Species Habitat

Evaluates high value
habitat areas located
within watersheds.

Indicates where burned
basins could impact
habitat conditions and
water quality.

VALUES AT RISK

75 100
Miles



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HAZARDS



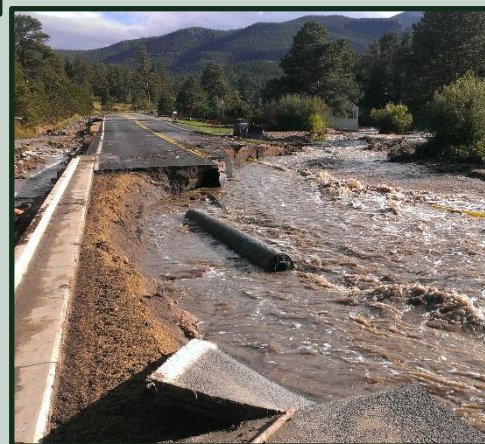
INCREASED RUNOFF



HILLSLOPE EROSION



MUD/DEBRIS FLOW



FLOODING



FLUVIAL HAZARD ZONE



Wildfire Ready Watersheds

Hydrologic Change

Evaluates magnitude of change in runoff following a fire.

Indicates watersheds where flood after fire will be a significant concern.

Wildfire Ready Watersheds

Statewide Post-Fire Susceptibility Assessment

HUC12 Ranking Choropleth Hydrologic Risk

Legend

- HUC12 Subwatersheds
- Continental Divide
- Major Colorado Waterbodies
- Major Colorado Rivers
- Basin Roundtable Delineations
- Highways
- Colorado Counties

Hydrologic Risk

Hydrologic Risk DQ_FL

- 0.00 - 2.70
- 2.71 - 4.48
- 4.49 - 6.13
- 6.14 - 7.96
- 7.97 - 10.30
- 10.31 - 13.61
- 13.62 - 25.06

DRAFT

INCREASED RUNOFF

HAZARDS



Wildfire Ready Watersheds

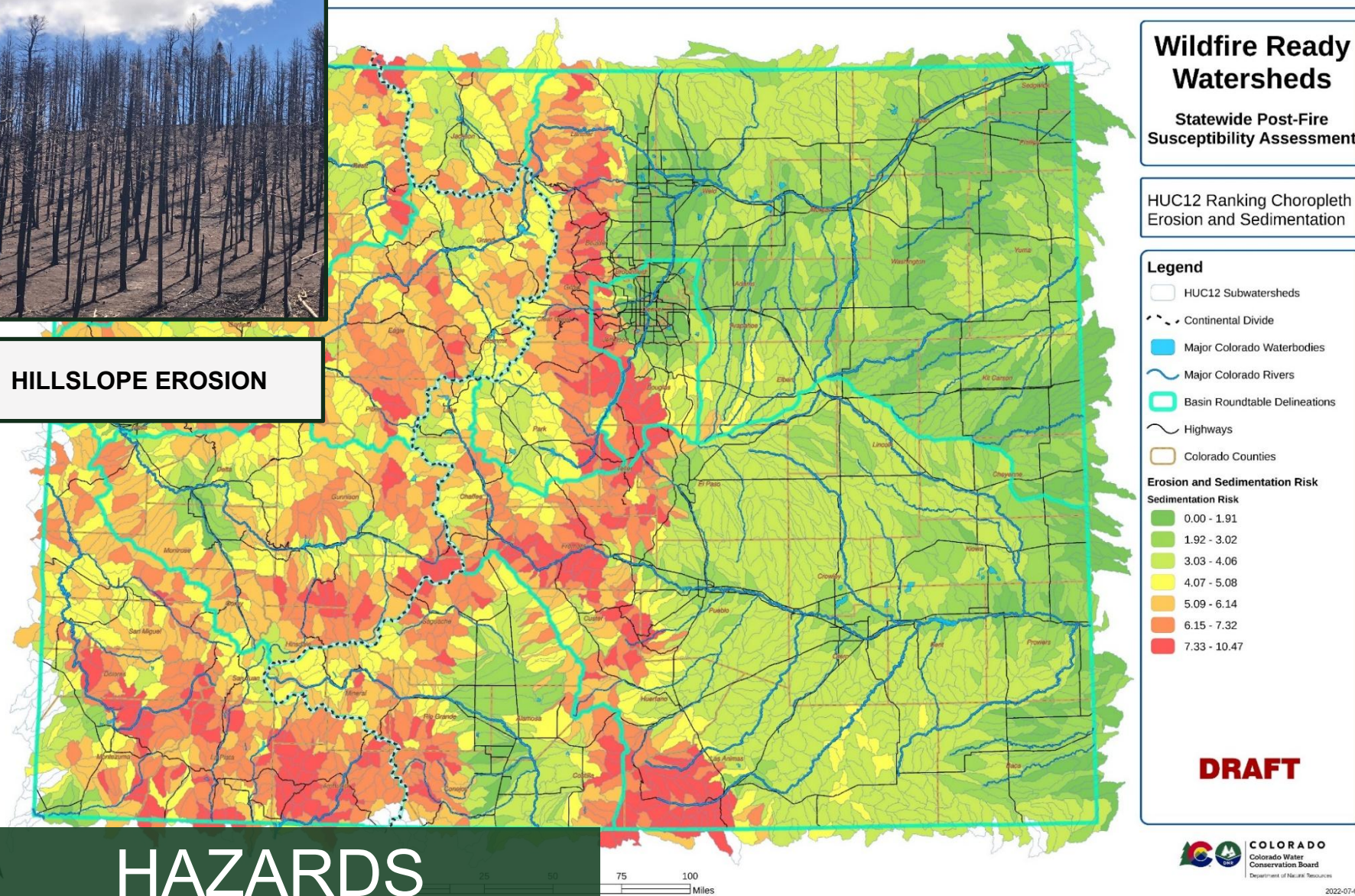
Hillslope Erosion

Evaluates magnitude of change in sediment yield pre and post fire.

Indicates watersheds where sedimentation and deposition will be a significant concern.



HILLSLOPE EROSION



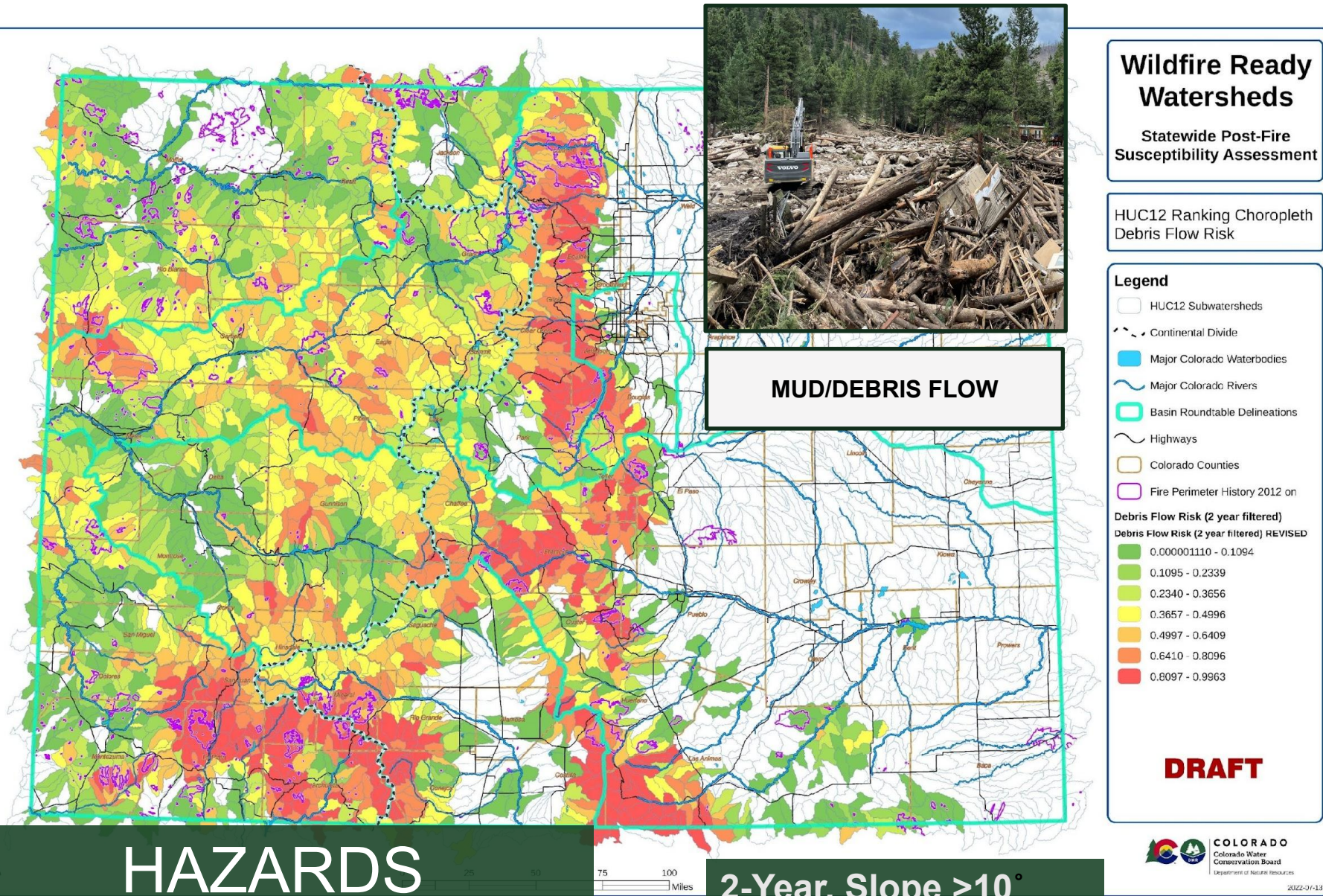


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Debris Flow

Identifies watersheds with high probability of debris flows.

Indicates watersheds where debris flow should be evaluated further to understand specific risk to life, infrastructure, and property.





Wildfire Ready Watersheds

RISK

$$\text{RISK} = \text{Probability Hazard} \times \text{Consequence Values-at-Risk}$$

Risk & Susceptibility

- Where values-at-risk are located
- Where hazards exist
- Understanding where hazards pose threats to values provides an overall understanding of susceptibility.



Wildfire Ready Watersheds

FRAMEWORK

What is a framework?

A comprehensive guide for local watershed advocacy groups and agencies that can be followed to produce local-level post-fire susceptibility evaluations on a watershed scale to direct pre-fire and post-fire mitigation actions.

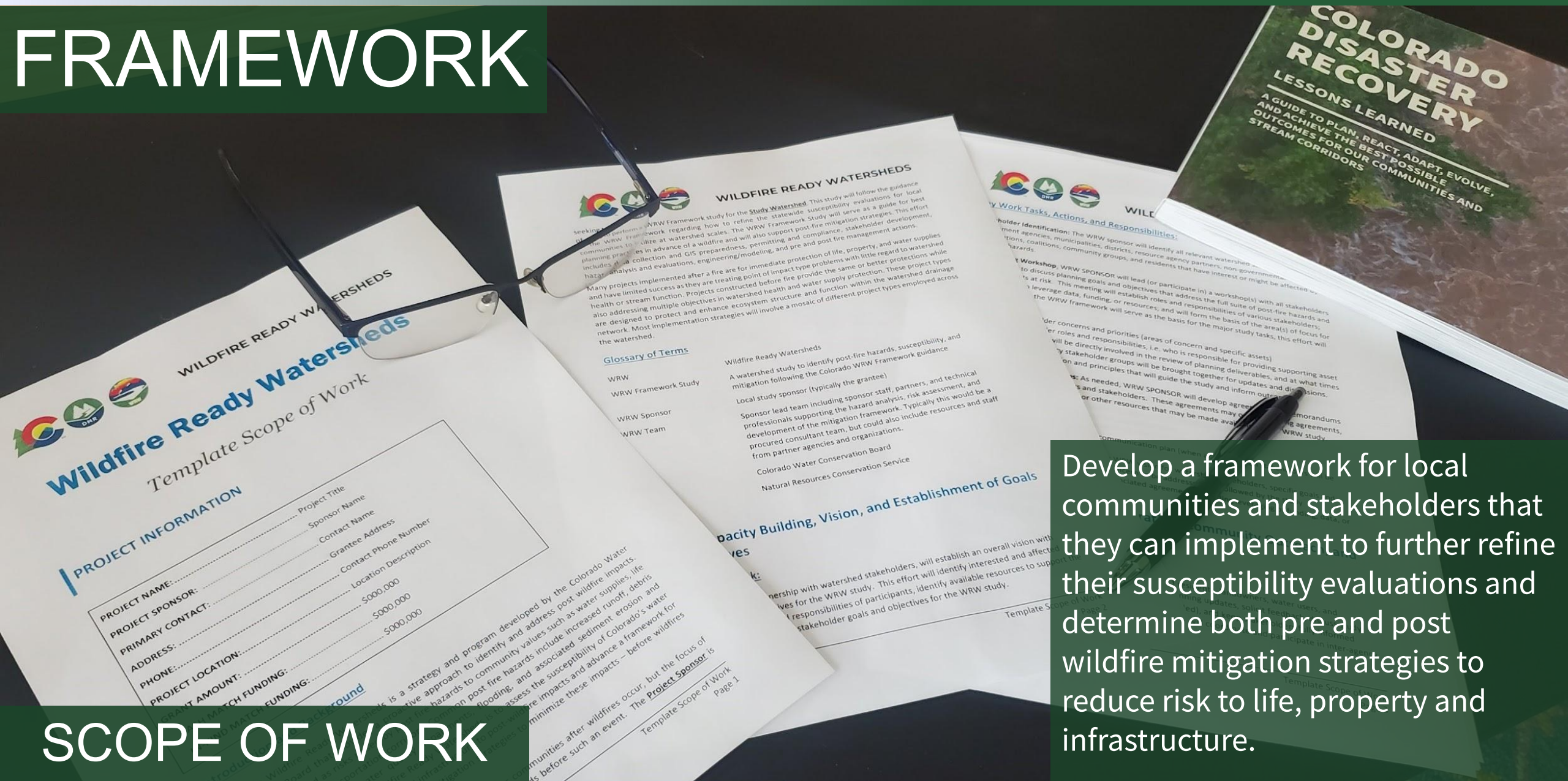
#wildfireactionplan101





Wildfire Ready Watersheds

FRAMEWORK



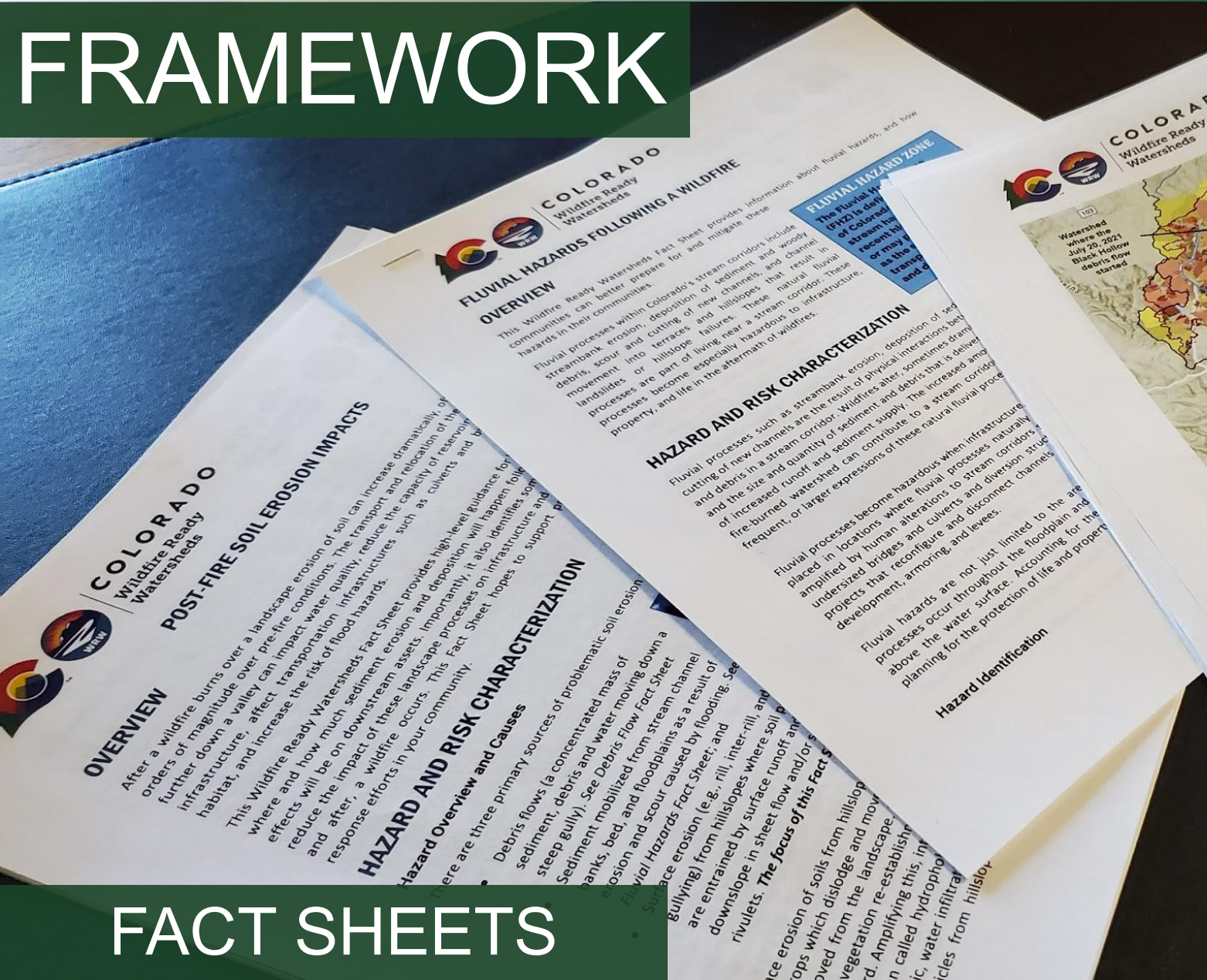
SCOPE OF WORK

Develop a framework for local communities and stakeholders that they can implement to further refine their susceptibility evaluations and determine both pre and post wildfire mitigation strategies to reduce risk to life, property and infrastructure.



Wildfire Ready Watersheds

FRAMEWORK



Fact Sheets:

- Hydrology/Hydraulics/Flood After Fire
- Debris/Mud Flow
- Fluvial Hazard Zone
- GIS Preparedness
- Stakeholder Outreach and Communication
- Hillslope Erosion
- Water Quality
- Municipal Water Supply

FACT SHEETS



Wildfire Ready Watersheds

FRAMEWORK

Task 1: Capacity Building, Vision, and Establishment of Goals and Objectives

- Identify partners and stakeholders
- Develop overall vision for the WRW Framework Study
- Establish study goals and objectives
- Develop and execute agreements with partners





Wildfire Ready Watersheds

FRAMEWORK

Task 2: Stakeholder Collaboration, Community Outreach, and Public Meetings

- Regular communication with stakeholders
- Community outreach activities
- Workshops including project prioritization and mitigation funding
- Website creation and maintenance



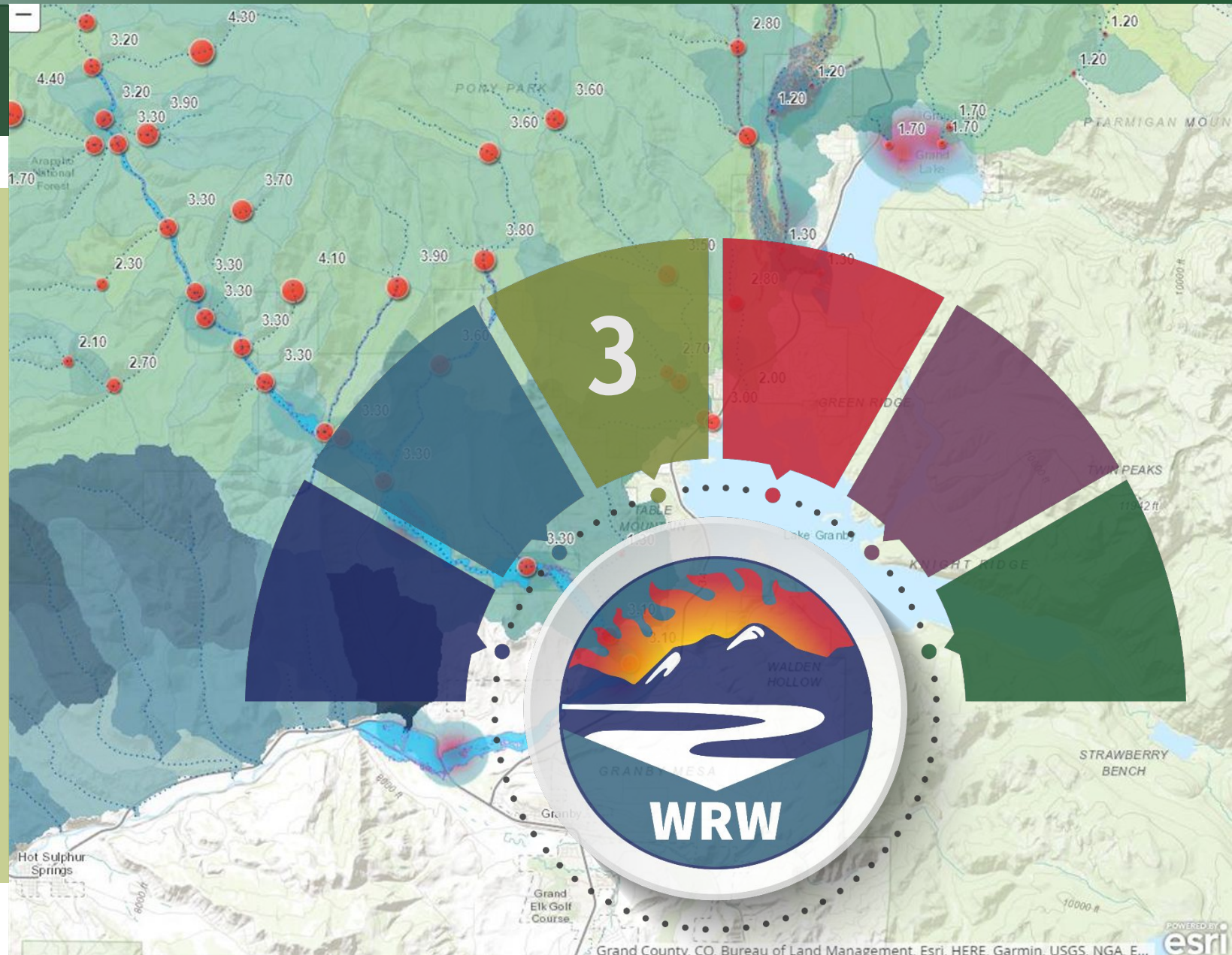


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FRAMEWORK

Task 3: Data Collection, Research, Review, and Gap Analysis

- GIS data collection for values at risk, hazards, and supporting information
- Previous study and research review
- Infrastructure operations
- Data gap analysis (what's missing for the best possible outcome?)





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FRAMEWORK

Task 4: Post Fire Hazard Analysis

- Analyses and evaluations to identify hazards for:
 - Hydrologic response
 - Floods after fire
 - Fluvial hazard zones
 - Debris flows
 - Hillslope and gully erosion
 - Water quality





Wildfire Ready Watersheds

FRAMEWORK

Task 5: Susceptibility Analysis

- Identification of Values-at-Risk using hazard overlay
- Determining consequences of post-fire hazards
- Developing a prioritization based on severity of consequences of post-fire impacts and





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FRAMEWORK

Task 6: Pre-Disaster Mitigation Activities

- Development of both a:
 - Pre-Disaster Preparedness Plan (Mitigation projects before a fire)
 - Post-Disaster Preparedness Plan (action plan following a fire)
- Prioritize actions
- Establish roles and responsibilities for mitigation activities
- Determine financial needs
- Permitting requirements





Wildfire Ready Watersheds

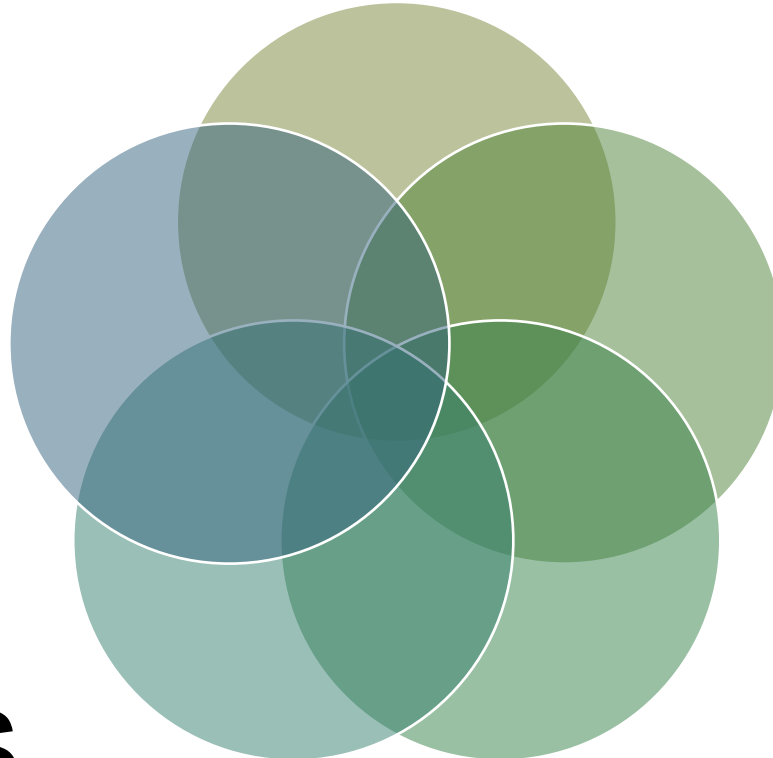
CWPP

HMP's

WRW

PODs

SMPs





Wildfire Ready Watersheds

Funding Opportunities

COLORADO WATERSHED RESTORATION PROGRAM

Grant Guidelines and Application

Special Release December 2022

American Rescue Plan Act

10M allocated to CWCB special release

Applicants must have a federal SAM account

25% Match requirement



Funding Opportunities

Federal Technical Assistance Grants for Colorado Water Projects

Grant Guidelines and Application

<https://cwcb.colorado.gov/federal-technical-assistance>

American Rescue Plan Act

5M allocated to CWCB special release

Applicants must have a federal SAM account



Public Water System - Values At Risk

- The CDPHE Source Water Protection Program has launched an initiative to provide **GIS Preparedness Support for PWS's**.
- **Free to PWS's; Digitize all infrastructure assets** (values at risk) in or near federal lands for your utility.
- Data can be used to inform grant applications, fuels mitigation CWPPs, SWPPs, and **WRW's Risk Assessments / Hazard Overlays**.
- Data will be uploaded to USFS Wildland Fire Decision Support System (**WFDSS**), and provided to **County OEM** for emergency response.



Wildfire Ready Watersheds

Public Water System - Values At Risk

- CDPHE works in partnership with CRWA
- Contact Program Managers below for more information

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Wildfire Ready Watersheds

Website

www.wildfirereadywatersheds.com



[About](#) [Statewide Study](#) [Local Framework](#) [Education/Resources](#) [FAQs](#) [Contact Us](#)

WILDFIRE READY WATERSHEDS

Working to understand the susceptibility of Colorado's watersheds to post-wildfire impacts and to plan and prepare for them— *before fires occur.*

Wildfire impacts don't stop when the flames do.

Impacts to water supplies, infrastructure, and human life can linger for many years after the firefighting crews head home. After a wildfire burns over a landscape, erosion of soil and runoff of rainfall can increase dramatically, oftentimes by several orders of magnitude over pre-fire conditions resulting in hazards within and downstream of burned areas as a result of transport and relocation of ash and debris further down valley (sometimes many miles from where a wildfire burnscar exists) can cause extreme impacts to water quality, reduce capacity of reservoirs, affect water delivery infrastructure, affect transportation infrastructures such as culverts and bridges, and increase the risk of flood hazards that threaten life and property.



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The Wildfire Ready Watersheds seeks to provide high-level guidance for helping communities predict what and where post-fire impacts will effect downstream impacts. Importantly, the Program also seeks to help identify some actions that may be taken to reduce the impact of these landscape



THANK YOU

Questions?

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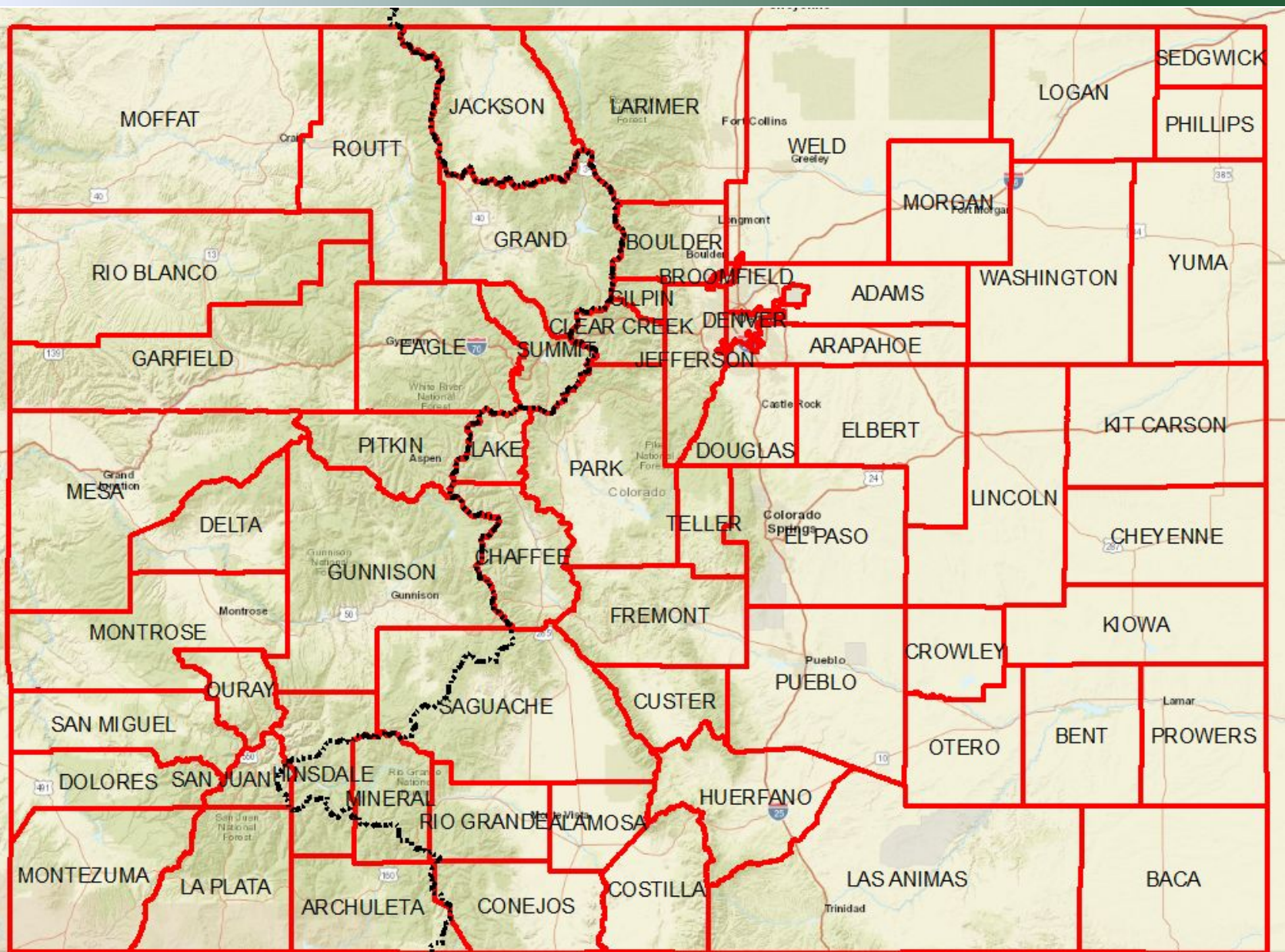
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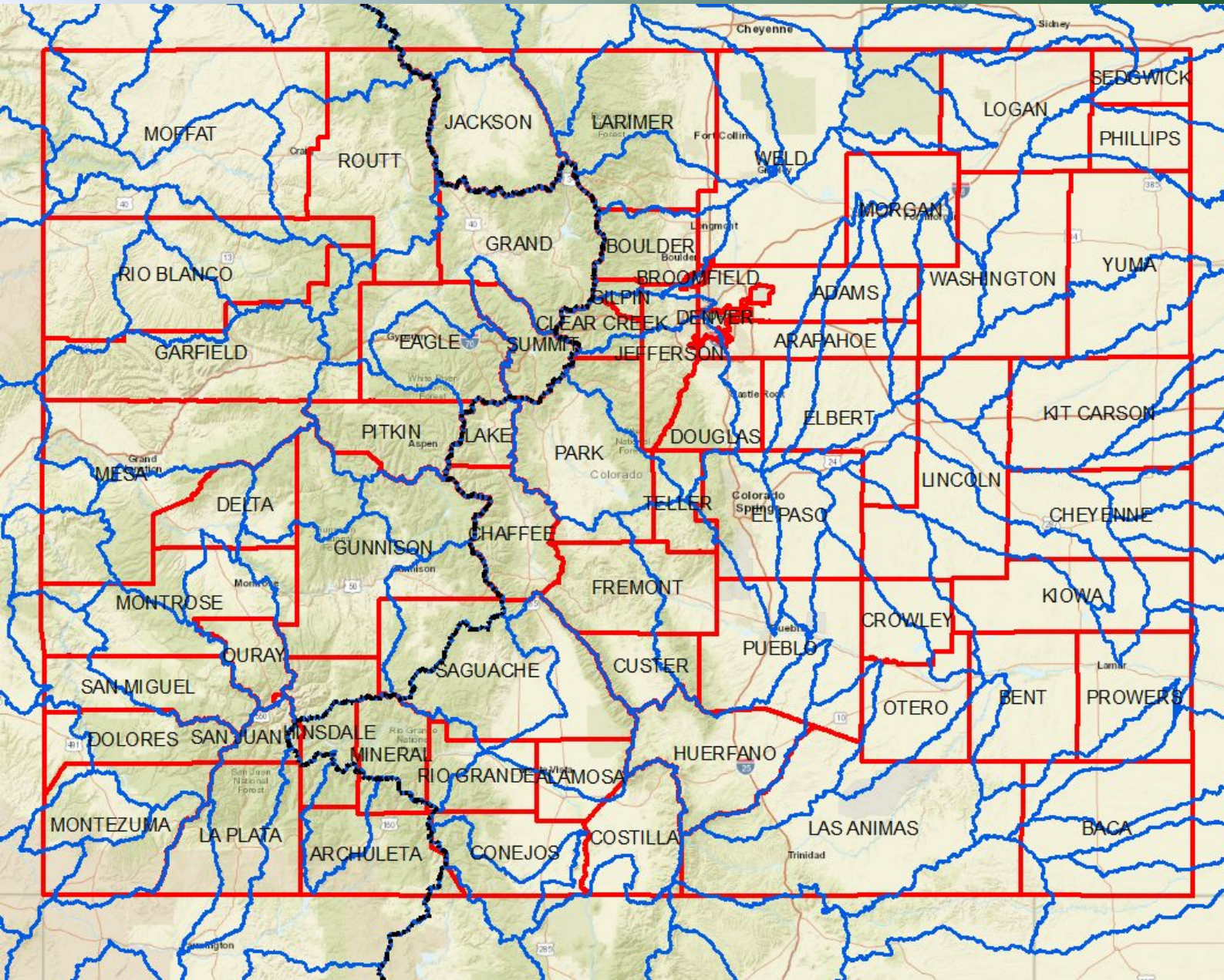
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Colorado Counties



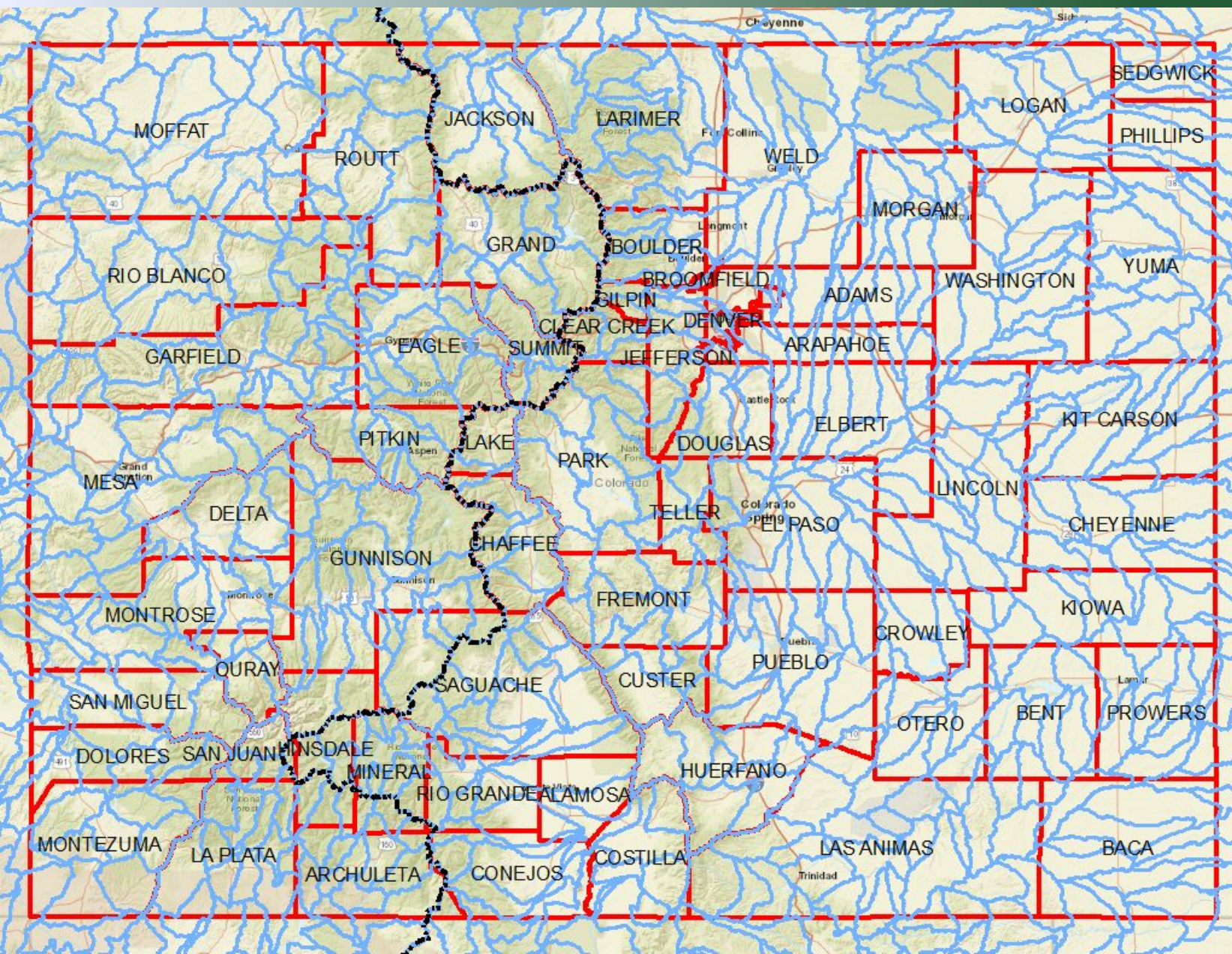
Wildfire Ready Watersheds



Colorado Counties
With
Hydrologic Unit
Codes 8's
(HUC 8)



Wildfire Ready Watersheds



Colorado Counties
With
Hydrologic Unit
Codes 10's
(HUC 10)