# Instructions

# Welcome

Esther Duke | Chief Operations Officer
Coalitions & Collaboratives | co-co.org

## AIM GRANT

CCOCO offers a unique wildfire mitigation funding opportunity for a wide variety of capacity-building activities, including personnel, planning and wildfire risk reduction work on non-federal land. .

## COMMUNITY MITIGATION ASSISTANCE TEAM

The CMAT works closely with Incident Management Teams, the U.S. Forest Service or other land management agencies, and community residents and leaders to identify mitigation opportunities before fire impacts the community.

COCO
COALITIONS & COLLABORATIVES, INC

CO-CO.ORG

2432 S. Downing St. Suite 101
Denver, Colorado 80210
719-412-3747

## COMMUNITY WILDFIRE MITIGATION BEST PRACTICES TRAINING

The CWMBP national-level training is designed for current or future mitigation specialists, wildfire program leads and others who work with residents and their communities, to become more efficient and effective at reducing wildfire risk.

## MITIGATION MENTORS

The Mitigation Mentors Program (MMP) provides one-on-one mentorship to increase wildfire mitigation, increase organizational capacity, improve community resilience and support wildland fire adaptation.

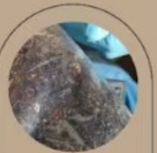
## COLDFIRE SEQUESTRATION

Coldfire is a group of mycology researchers investigating the use of native fungi to heal and improve our forests with the forest ecology itself. Fungal-produced composts have been scientifically proven to hold twice as much carbon. This could provide an opportunity in which to increase our carbon stores naturally and safely.

Wood chips produced from forest mitigation

Infuse with fungi for rapid decomposition

Decomposition after one season



Compost in a matter of two seasons as opposed to two decades

## AFTER THE FLAMES

A series of webinars and biannual conferences providing tools and tactics for communities and agencies impacted by wildfire.

## RIVERBANK

A revolving loan fund that provides bridge funding for project implementation for conservation collaboratives. Funding is designed to increase the efficiency and impact of existing investments.

ATF

After the Flames

brought to you by Coalitions & Collaboratives, Inc.

*Tools and tactics for communities and agencies impacted by wildfire.*

# Save the Date

April 15-17, 2024

YMCA of the Rockies, Estes Park, Colorado

co-co.org | aftertheflames.com

# Using Mentimeter

- Scan the QR code or enter menti.com into your computer's web browser
- Enter the code given in the QR box or info bar above
- Follow along and participate in the webinar

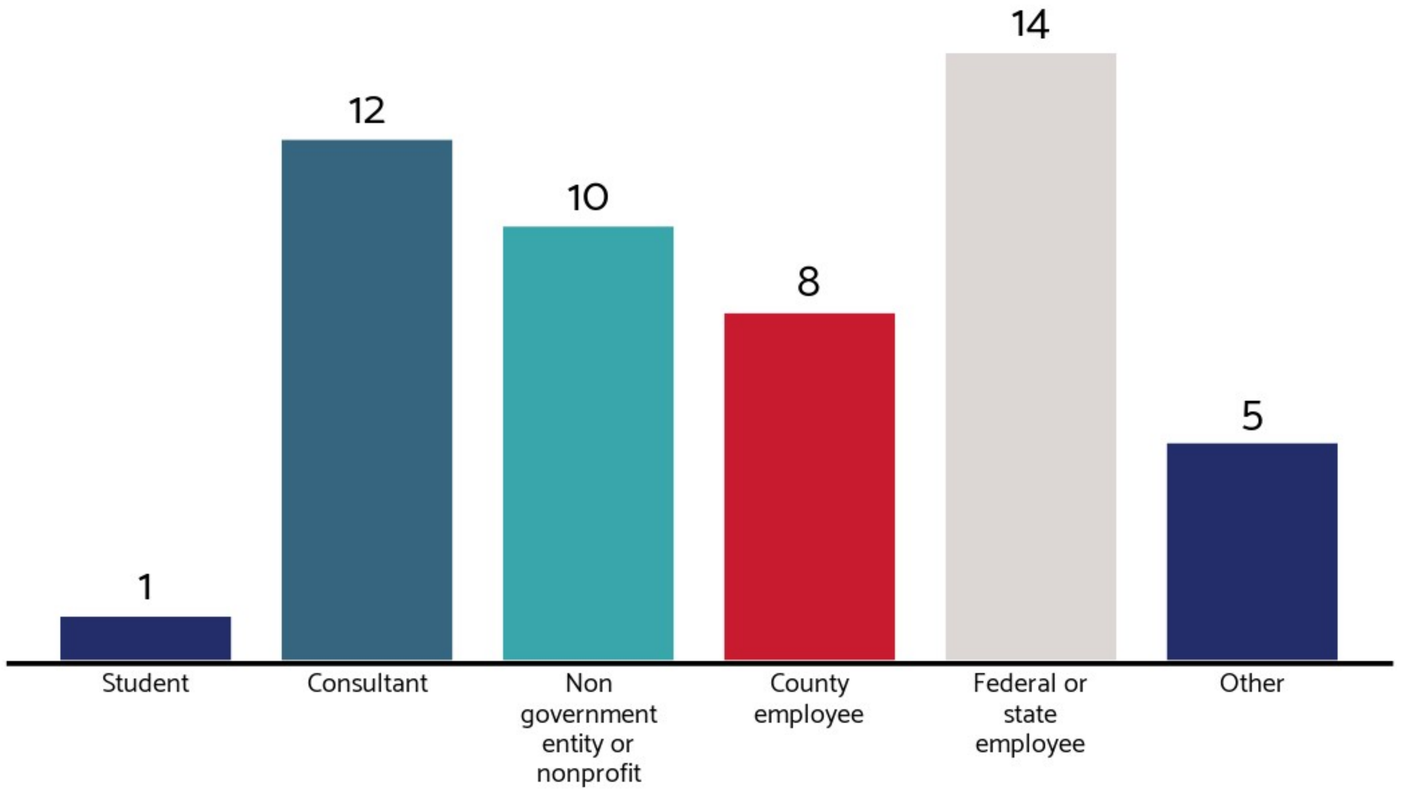
# Discussions, Polling, Q&A,

- Polling is anonymous. Please be respectful and professional.
- Please reserve GoToWebinar's 'Question' box for technical issues.
- Please note we will try to address all questions and comments in the webinar recording.

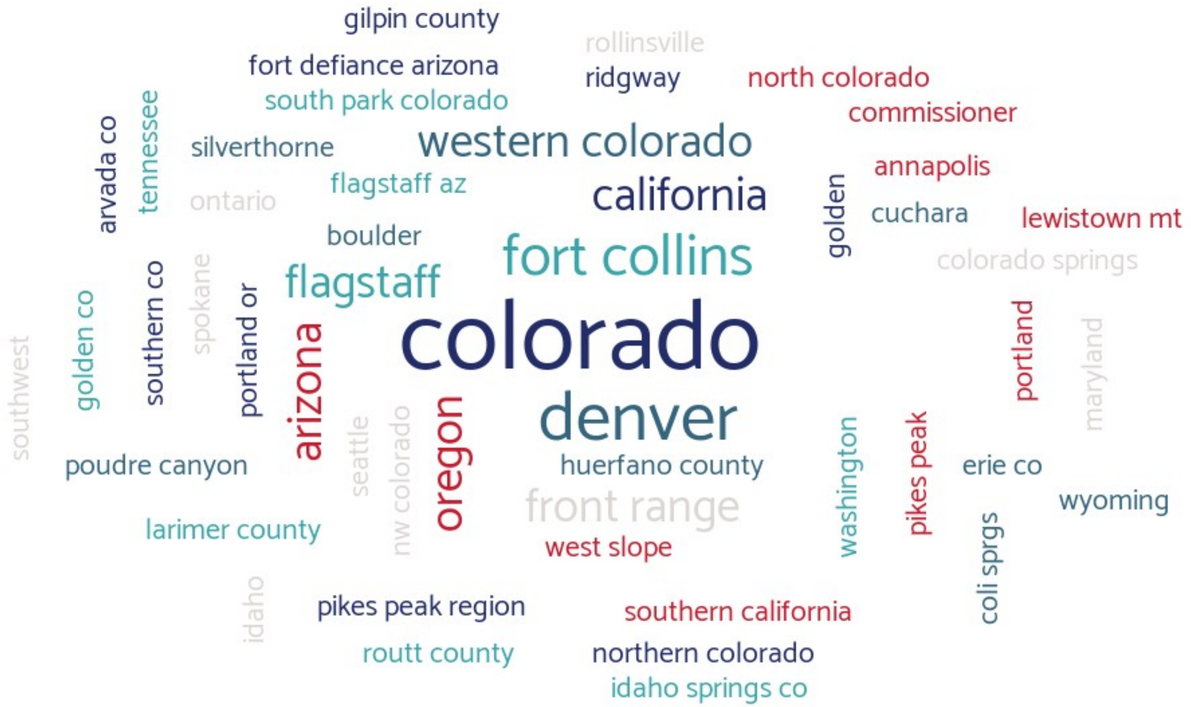
# We ask that you please...

- take care of yourself
- practice confident humility – the self-awareness that we all have wisdom and we will always have more to learn
- consider listening if you talk often (if you often listen quietly, consider speaking up)
- listen actively and with an ear to understanding others' views
- speak your truth using "I" statements
- avoid assumptions
- commit to learning, not debating
- embrace paradox

# I'm a


1
12
10
8
14
5
Student
Consultant
Non government entity or nonprofit
County employee
Federal or state employee
Other

# What geographic location are you joining us from?



# What do you hope to get from this webinar? 48 Answers

| | | |
|---|---|---|
| Learn! | How to manage burn areas | Resilience |
| Answers | What others are doing post-fire | Fire preparedness and restoration from an ecological perspective |
| Insight | collaboration | jumping off point for post fire recovery planning |

# What do you hope to get from this webinar? 48 Answers

| | | |
|---|---|---|
| Info on WRW | Protect drinking water sources | Partnership opportunities |
| Diverse perspectives from others. | Types of projects funded by WRW | big picture overview and actions |
| learn about grant programs and efforts funding wildfire resiliency efforts | Interested in applying for a WRW grant | Information/learning |

# What do you hope to get from this webinar? 48 Answers

Collaboration

More about the Wildfire Ready Watersheds Program

Find out about funding for assessments of where to do work and to implement process-based restoration.

Lessons learned & success stories for wikdfire

Get to know the users more

How information and data sharing occurs between decision makers and data providers

Building resiliency in my community

WRW Funding opportunities

Adding to my knowledge base on post-fire recovery, particularly for erosion prevention.

# What do you hope to get from this webinar? 48 Answers

| | | |
|---|---|---|
| State of the science, Policy and State Initiatives, Funding | Learn | Latest technology/methodologies for pre-wildfire planning |
| Wildfire mitigation efforts/resiliency and restoration techniques | Watershed relationship with wildfire | Gain insight into post fire planning needs and learn from others |
| mitigation funding for countiesrecovery strategiesbest practices to get landowner participation in mitigation | Post fire environment knowledge improvement | what all should we be doing to make our water shed ready. |

# What do you hope to get from this webinar? 48 Answers

Preparedness and resilience

Information on post-fire recovery

How to position ourselves for CWCB funding to protect our watersheds using conserved (and other) lands.

I want to learn and understand the Wildfire Ready process and how to help communities prepare for wildfires mitigation.

To learn more about how recovery efforts are linking wildfire and watersheds

get to know the users

As a County Commissioner i would like to gain more knowledge in every aspect, grants, mitigation strategies etc

Learn more about wildfire resiliency and risk management practices in other regions.

Insight

# What do you hope to get from this webinar? 48 Answers

Ways to protect my community and information to add to our cwpp.

More knowledge on mitigation

hear what others are doing to prepare watersheds for wildfires; we are actively investing in forest restoration and plan to add watershed restoration to that effort as well.

# WILDFIRE READY WATERSHEDS

## STATEWIDE POST-FIRE SUCEPTIBILITY

**Program Update June, 2023**

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

# 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

**Ecological resilience** is “the capacity of an **ecosystem** to absorb repeated disturbances or shocks and adapt to change without fundamentally switching to an alternative stable state” (Holling, 1973).

# Wildfire Ready Watersheds


Parents of a lazy river

*Photo by Dariusz Kowalczyk, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=20672076*

# 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

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

# COLORADO WATERSHED RESTORATION PROGRAM

## Grant Guidelines and Application

## Special Release 2023

**https://cwcb.colorado.gov/funding/grants**

# Wildfire Ready Watersheds

**Jeff Sickles, PE, CFM**
Project Manager

**Katie Jagt, PE, CFM**
Stream Design and Management Expert

**Michael Blazewicz**
Geomorphologist

**Carol Ekarius**
Stakeholder Coordination and Recovery Specialist

**Gerald Blackler, PhD, PE, D.WRE.**
Principal Hydrology and Hydraulics Engineer

**Andrew Earles, PhD, PE, D.WRE, CPESC**
Fire Hydrologist and Mitgation Engineer

# COMPONENTS

**STATEWIDE SUSCEPTIBILITY**

**FRAMEWORK FOR COMMUNITIES**

# POST-FIRE IMPACTS

**IMMEDIATE IMPACTS** → **POST-FIRE IMPACTS**

Threats to Life and Infrastructure

Threats to Water Resources

Threats to Water Quality

# CONCEPTUAL APPROACH

## Values at Risk

- Water Infrastructure
- Public Infrastructure
- Property
- Life Safety

×

## Post-Fire Hazards

- Floods After Fire
- Fluvial Hazards: Channel migration, erosion, and deposition
- Mud & Debris flows
- Water Quality Impairments
- Hillslope erosion

=

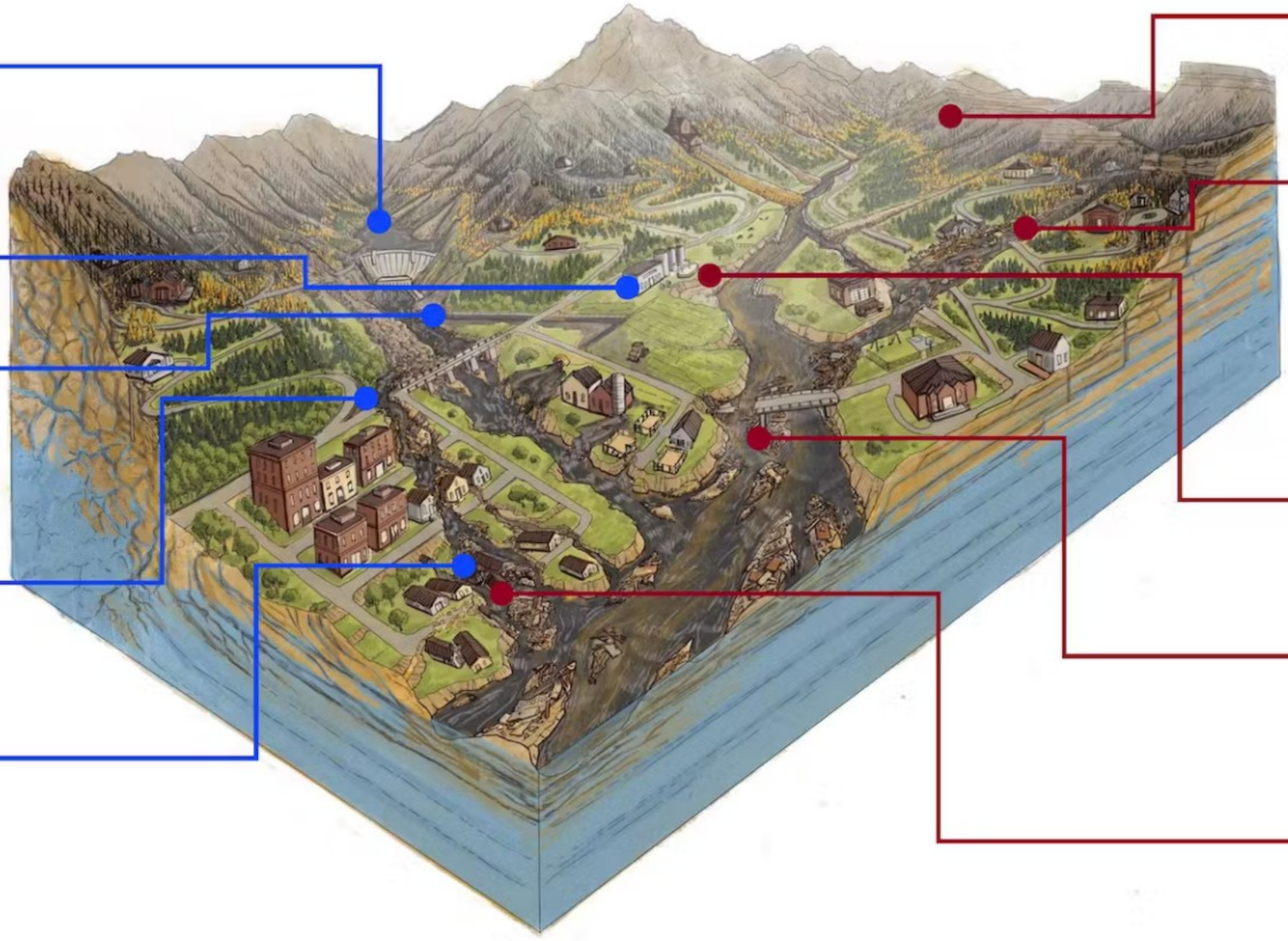
## Susceptibility

- Statewide Level
  - *Relative Risk by Watershed*
- Framework
  - *Direct Intersects*

# Wildfire Ready Watersheds

## VALUES AT RISK

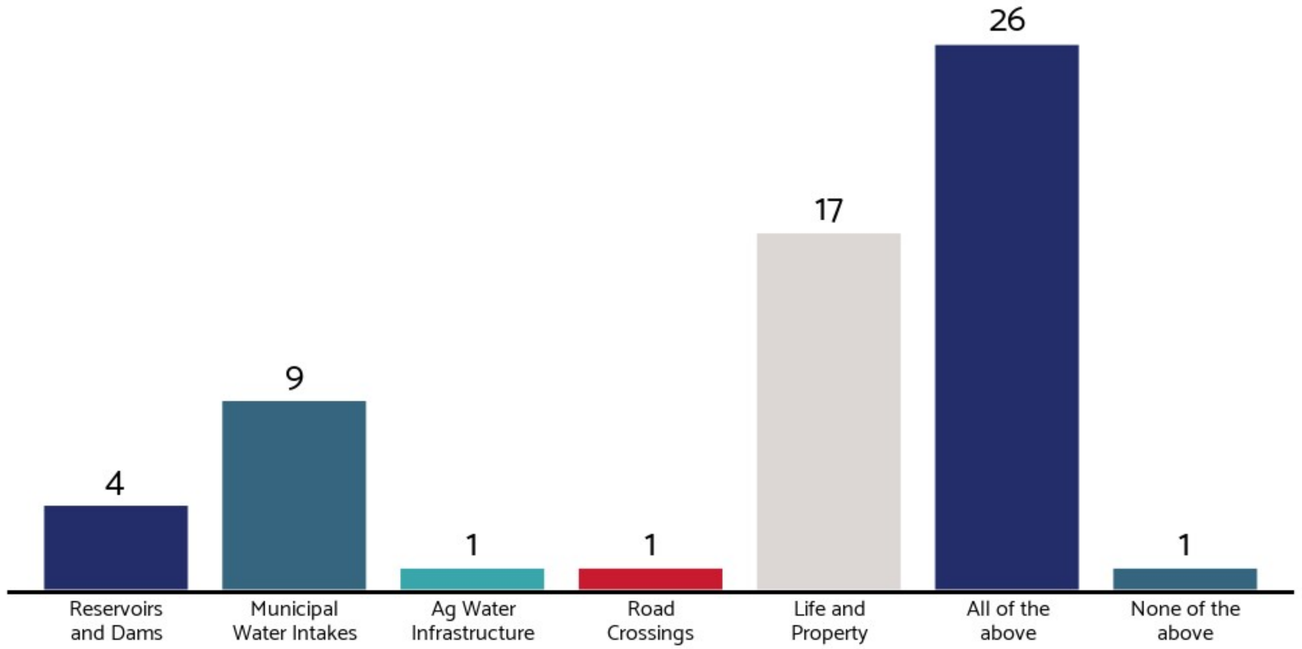
- Reservoirs and Dams
- Municipal Water Intakes
- Ag Water Infrastructure
- Road Crossings
- Life and Property



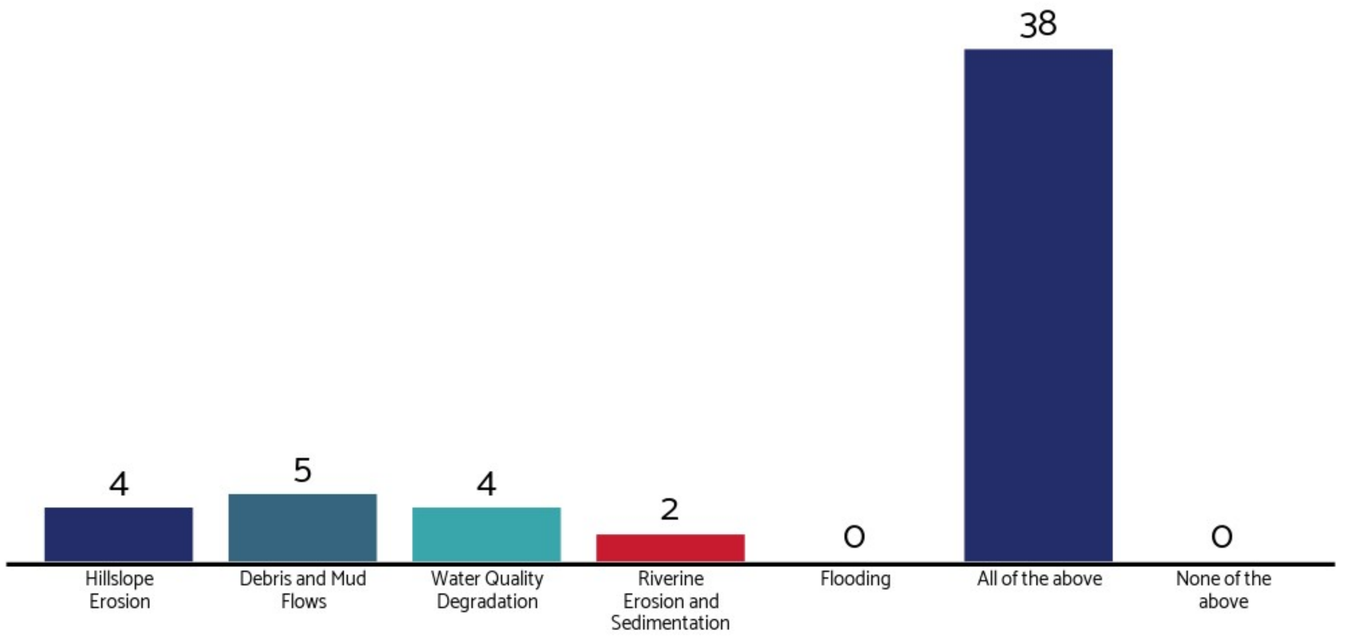
## HAZARDS

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

# Which value at risk is most important to you?



# Which post fire hazard are you most concerned about?



# SUSCEPTIBILITY

## PART 1: IDENTIFICATION OF VALUES AND ASSETS

**WATER INFRASTRUCTURE**

- BUILT WATER INFRASTRUCTURE
- SOURCEWATER
- HABITAT AND CONSERVATION AREAS

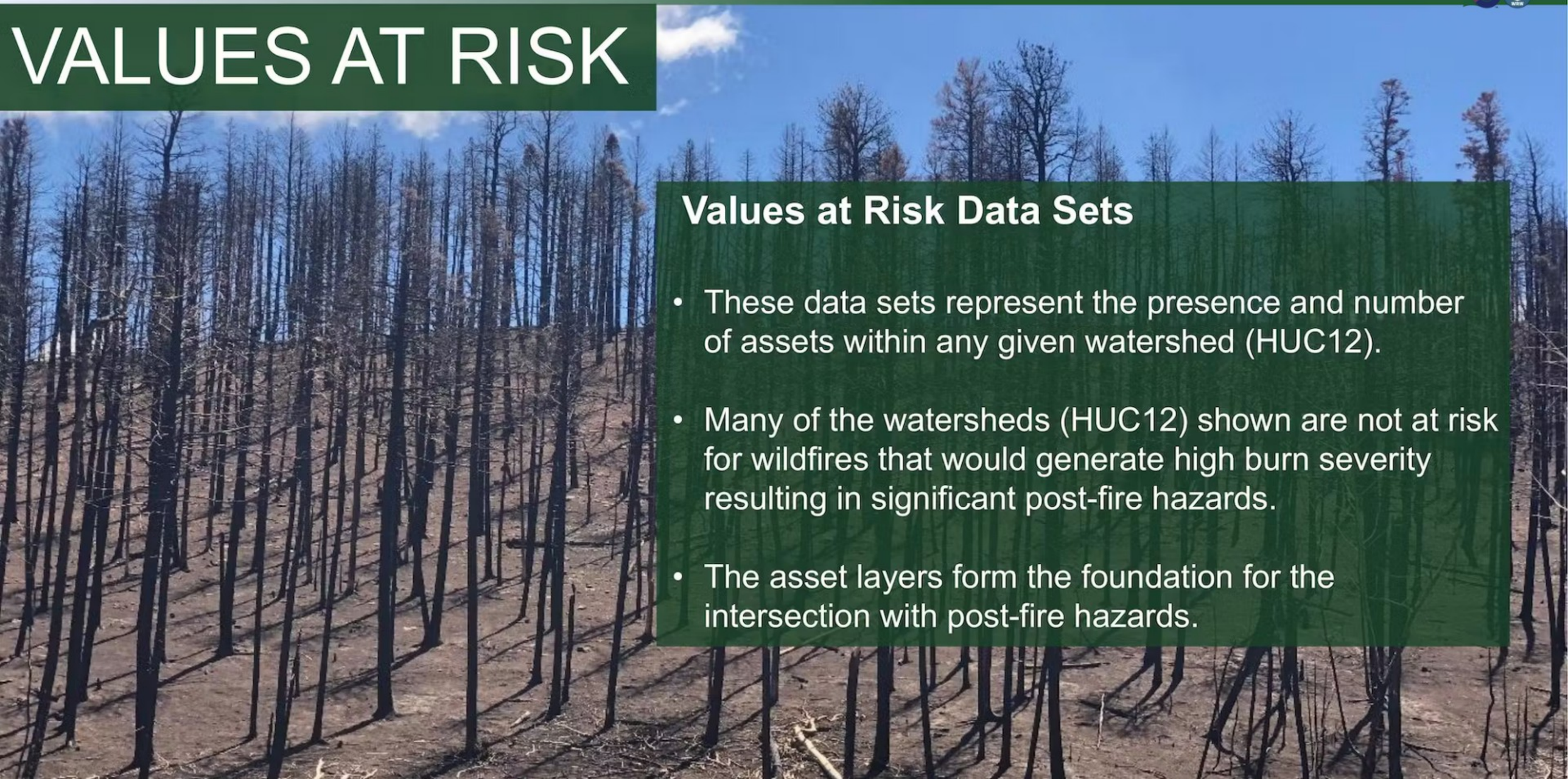
**LIFE & PROPERTY**

- BUILDINGS
- CRITICAL FACILITIES
- TRANSPORTATION INFRASTRUCTURE





# VALUES AT RISK

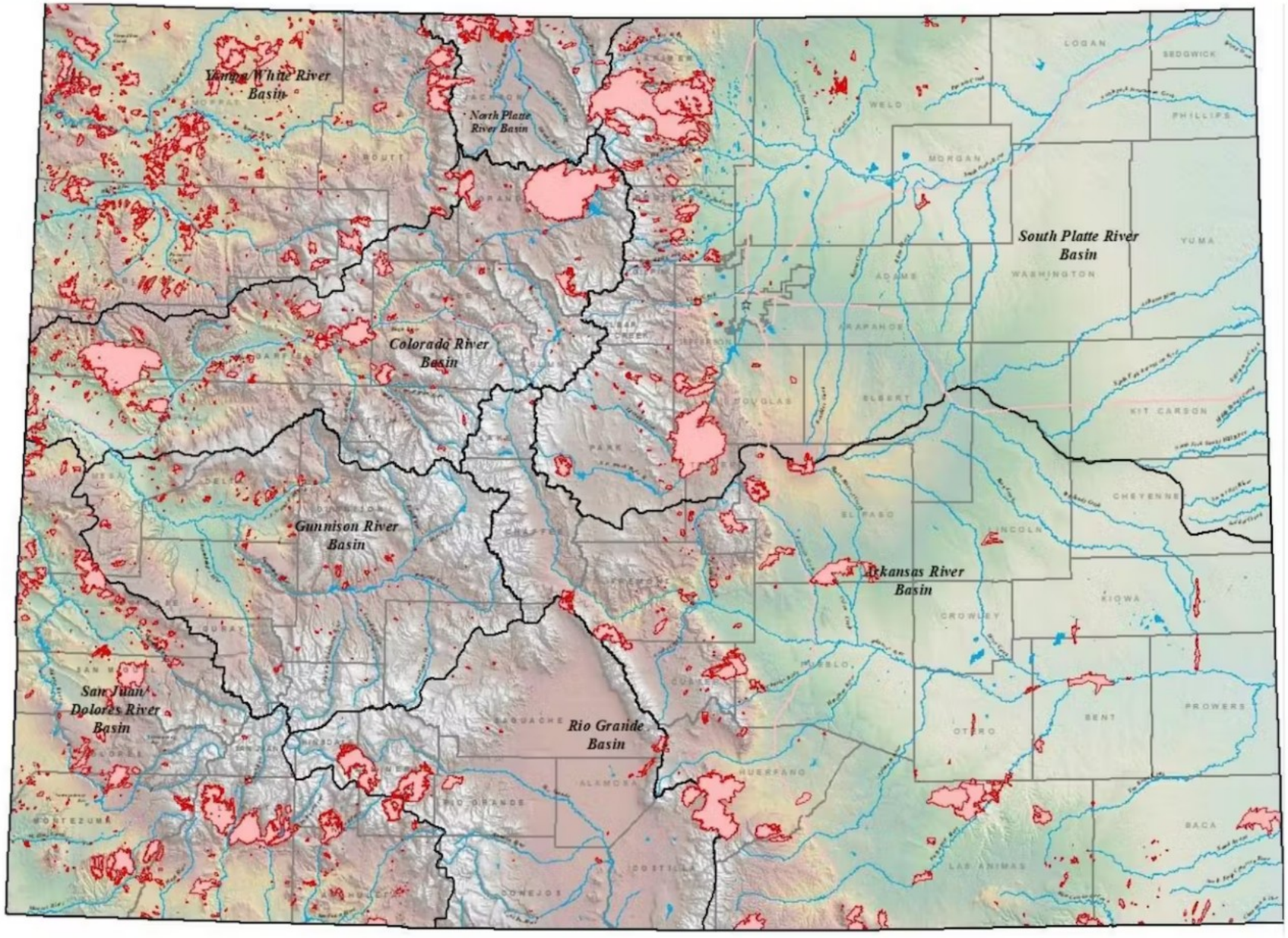


## Values at Risk Data Sets

- 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

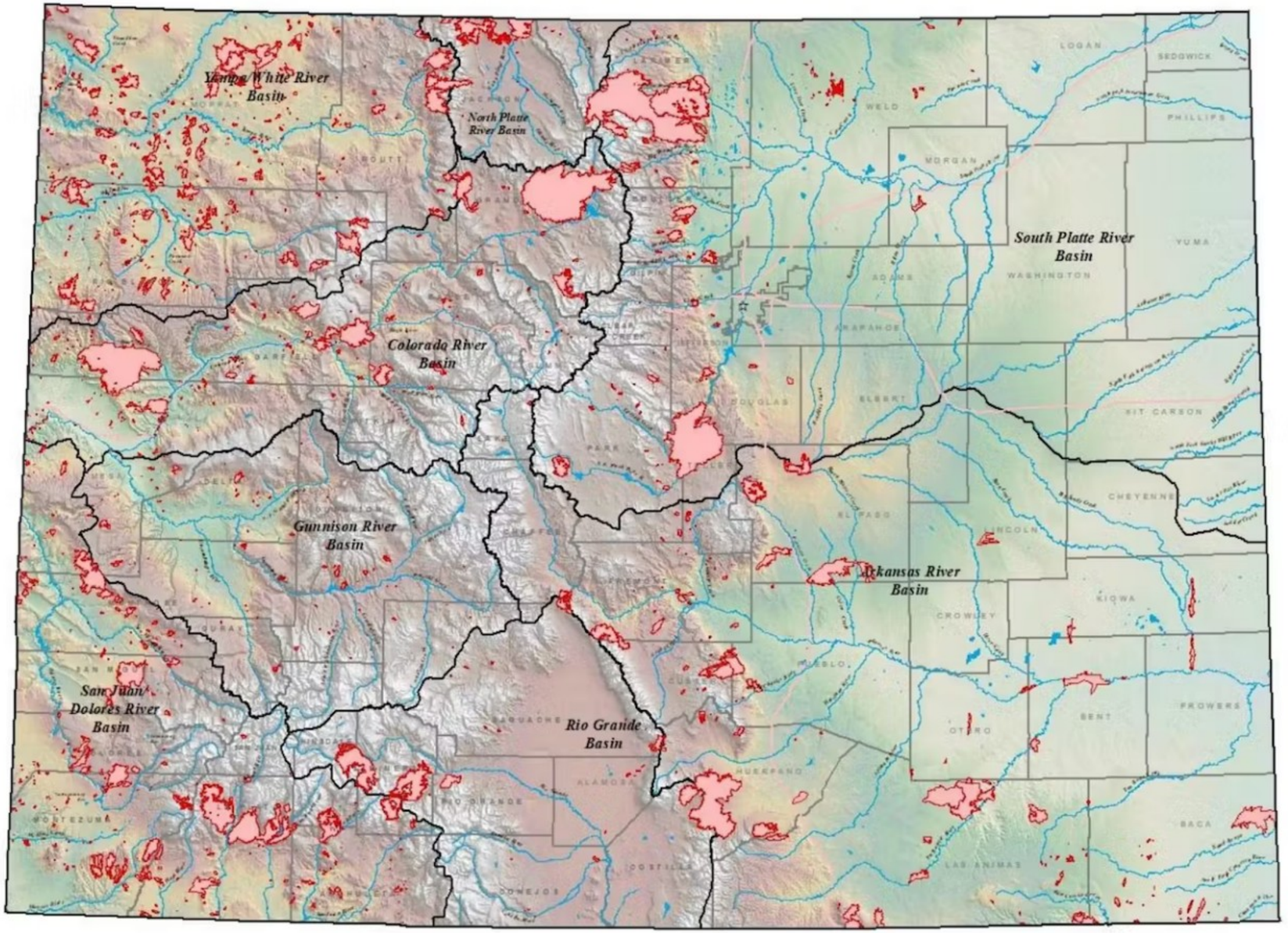
## Colorado Fires 1890-2020




National Interagency Fire Center.
Data downloaded from
https://data-nifc.opendata.arcgis.com/

# Wildfire Ready Watersheds

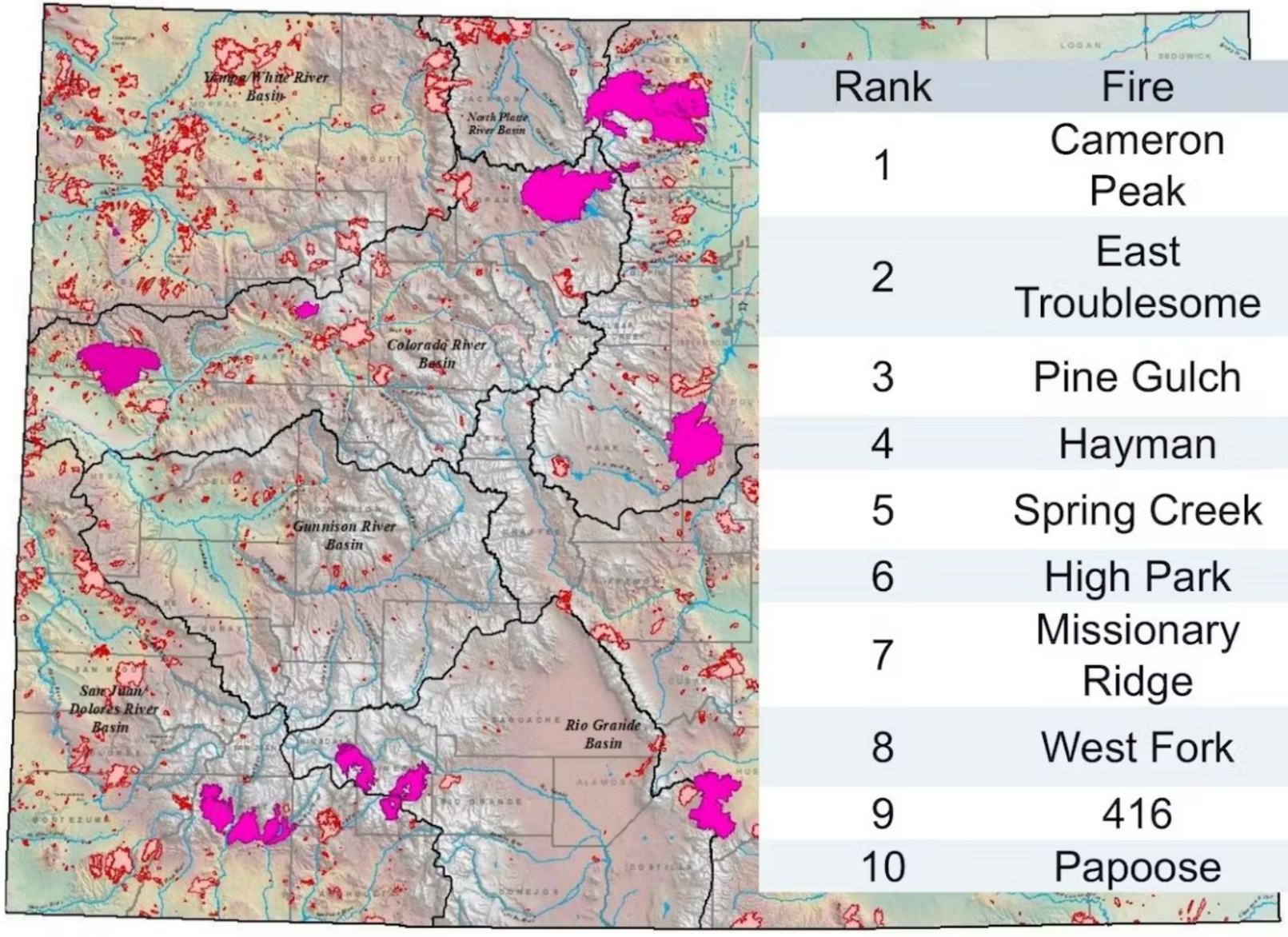
## Colorado Fires 2002-2020




National Interagency Fire Center.
Data downloaded from
https://data-nifc.opendata.arcgis.com/

# Wildfire Ready Watersheds

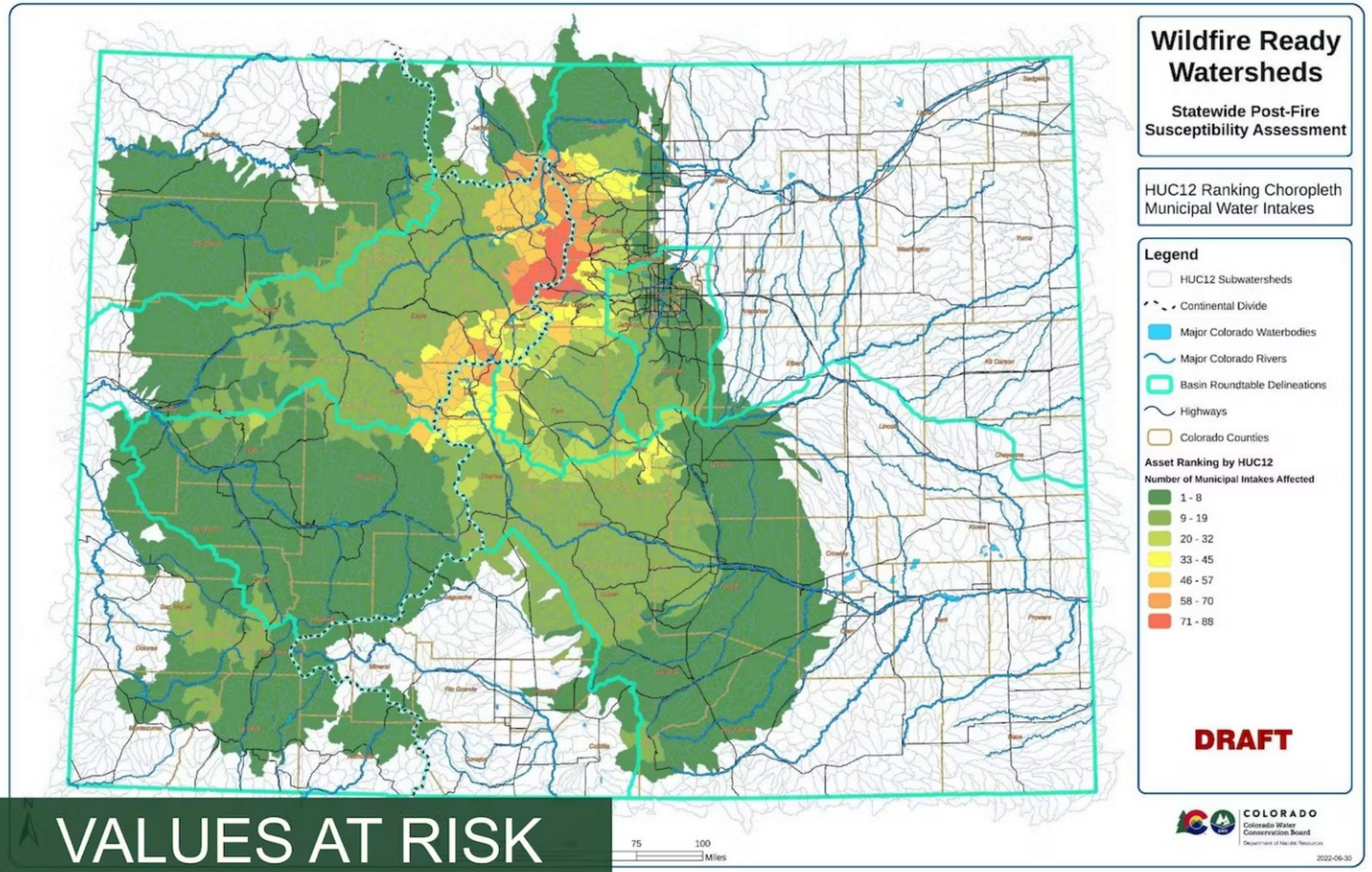
## Colorado Fires - Ten Largest




| 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 |

National Interagency Fire Center. Data downloaded from https://data-nifc.opendata.arcgis.com/

# Wildfire Ready Watersheds




## MUNICIPAL INTAKES

Sourcewater

Watersheds upstream of each intake.

Evaluates the number of intakes that rely on any given watershed.

## VALUES AT RISK

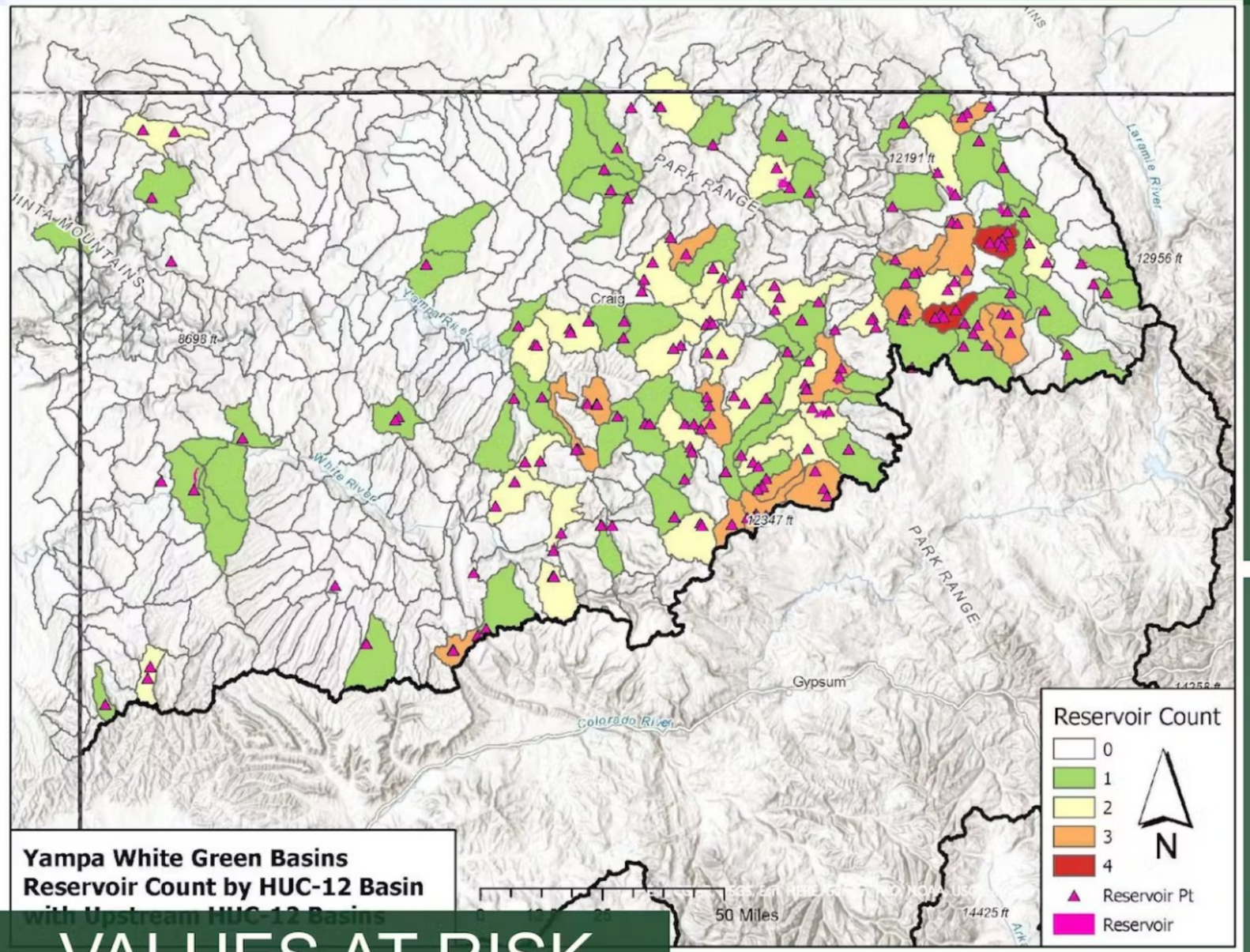
# RISK

## Evaluating Reservoirs

- Looking at upstream watersheds as values-at-risk (adjacent HUC-12 and one HUC upstream)
- Number of reservoirs (points) within a given HUC. Presence of assets.

## VALUES AT RISK

# Wildfire Ready Watersheds




## Storage Reservoirs

Identifying reservoirs and watersheds that directly discharge into reservoirs.

Impacts due to:

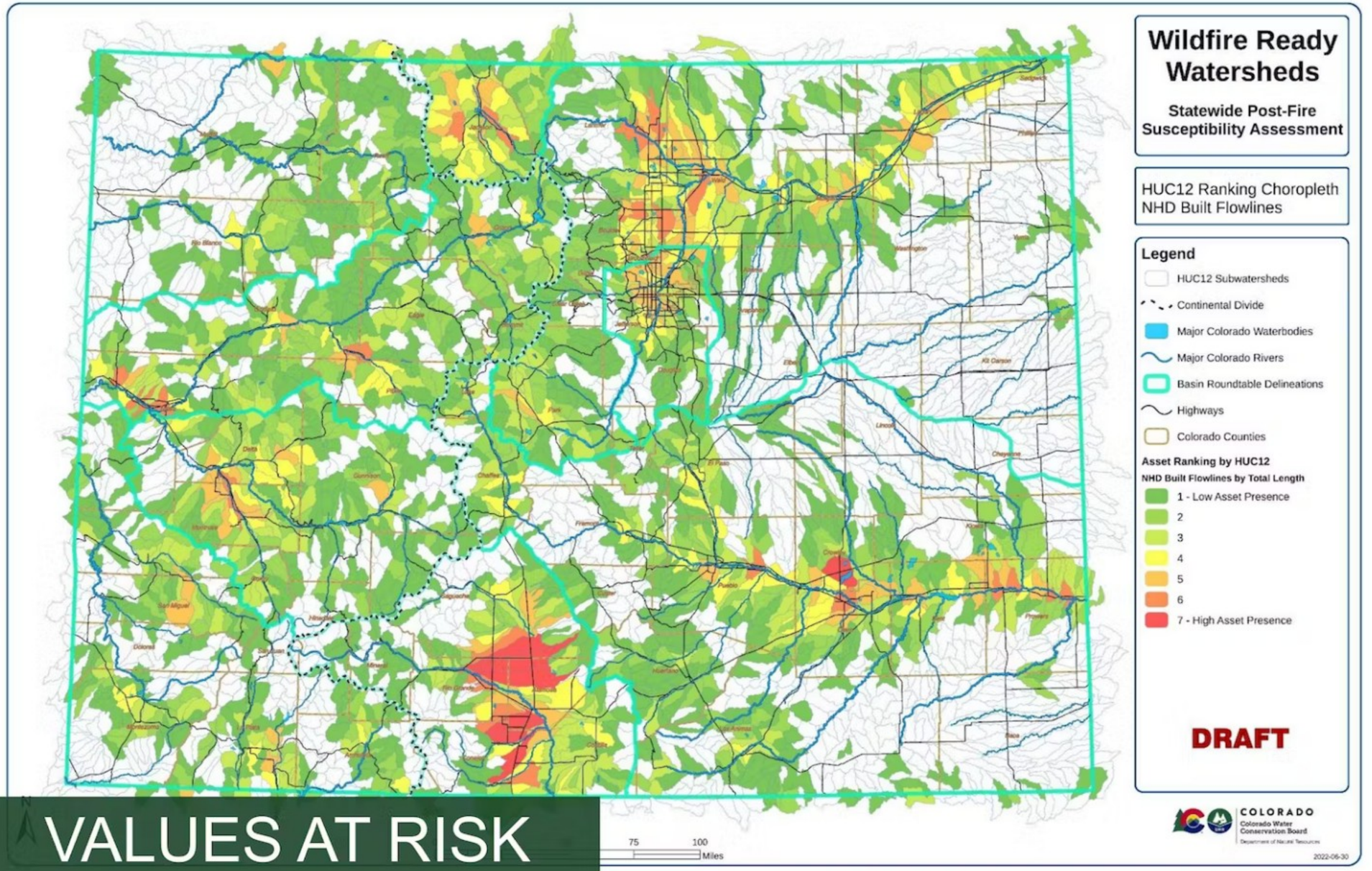
- Sedimentation
- Debris flows
- Water quality degradation
- Increased runoff

## Evaluating Reservoirs

- Looking at upstream watersheds as values-at-risk (adjacent HUC-12 and one HUC upstream)
- Number of reservoirs (points) within a given HUC. Presence of assets.

## VALUES AT RISK

# Wildfire Ready Watersheds




## Built Flowlines

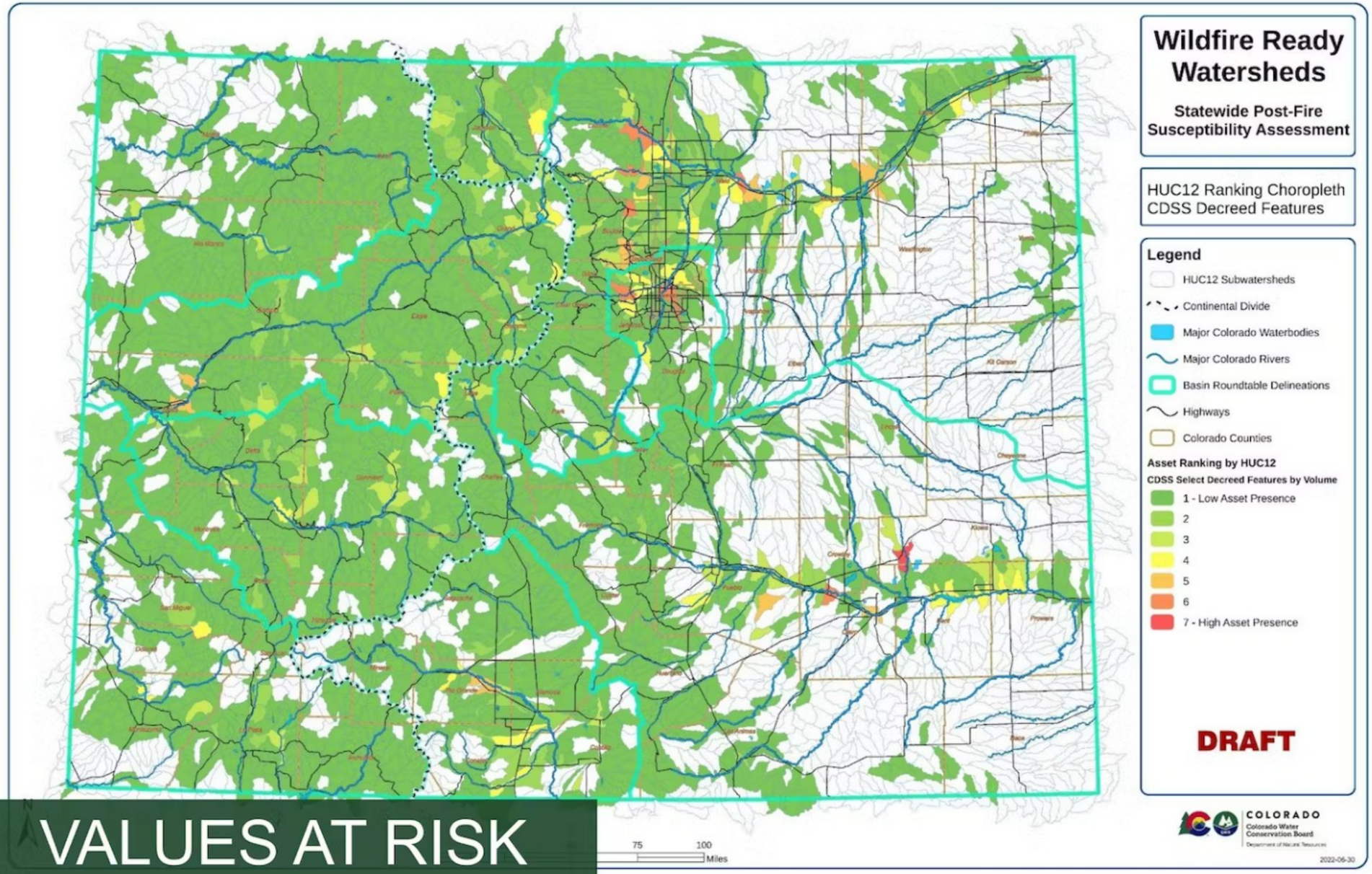
Built diversion infrastructure within a watershed.

Evaluates the length of Conveyance ditches by HUC.

Indicates where burned basins could affect downstream water users.

## VALUES AT RISK

# Wildfire Ready Watersheds



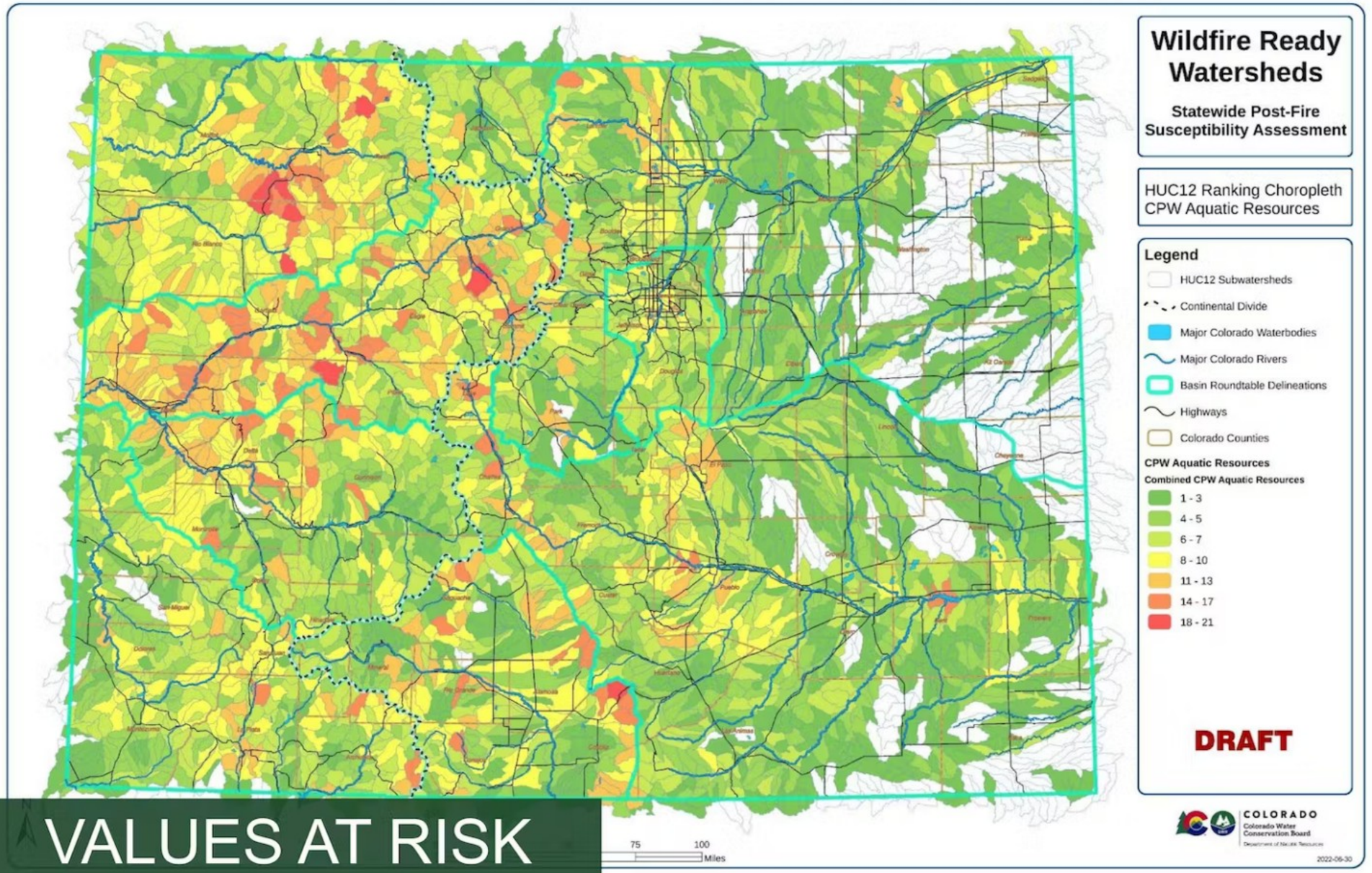

## Decreed Water Rights

Considers water rights/diversion points by decreed volume.

Indicates where burned basins could affect downstream water users.

## VALUES AT RISK

# Wildfire Ready Watersheds




## 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

# HAZARDS

INCREASED RUNOFF

HILLSLOPE EROSION

MUD/DEBRIS FLOW

FLOODING

FLUVIAL HAZARD ZONE

# RISK

**RISK = Probability / Hazard × 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

INCREASED RUNOFF




HAZARDS

## 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

HILLSLOPE EROSION




## Hillslope Erosion

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

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

HAZARDS

# Wildfire Ready Watersheds

MUD/DEBRIS FLOW




HAZARDS

2-Year, Slope >10°

## 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

FLOODING





HAZARDS

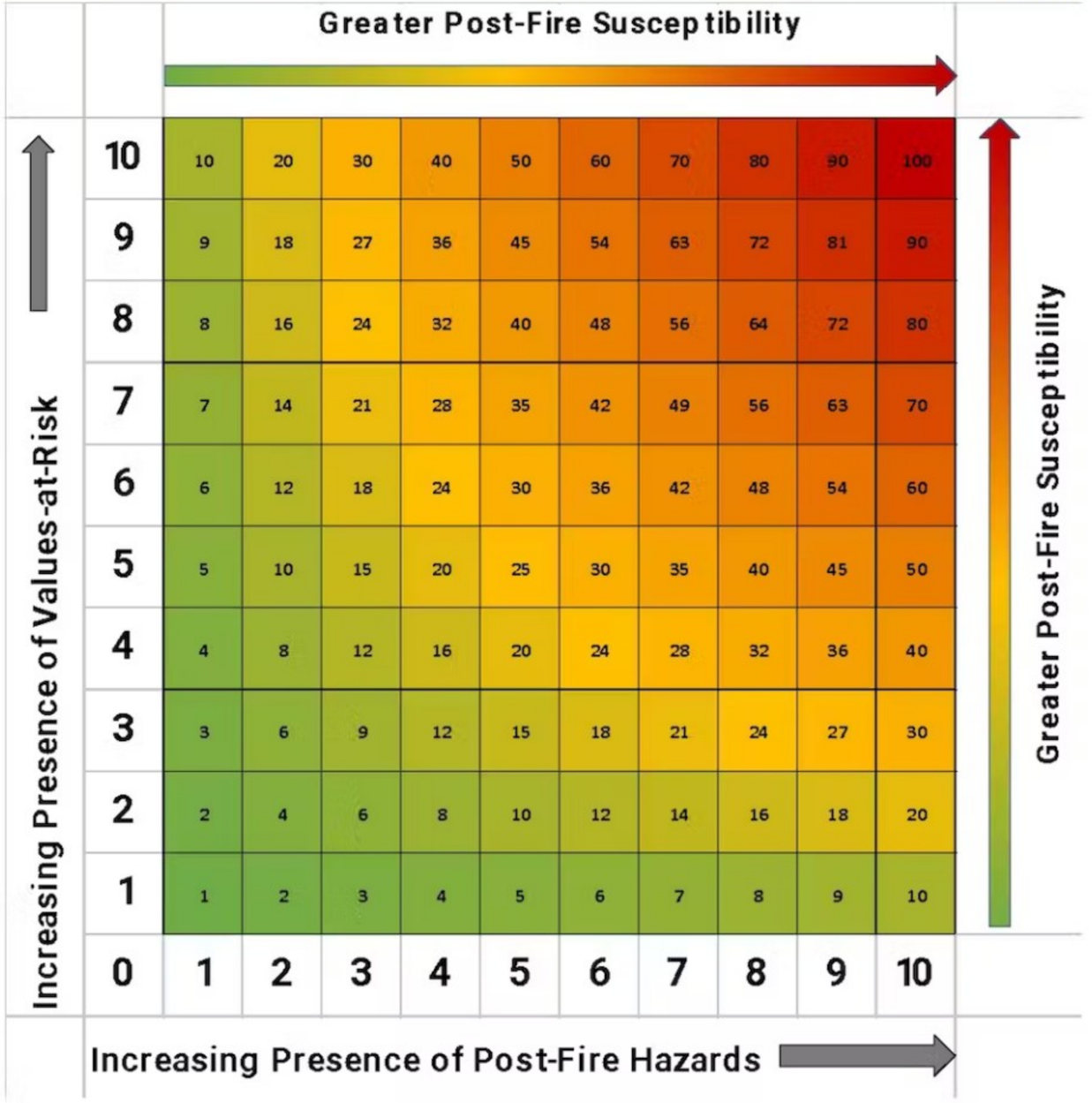
## Flooding

Evaluation of where post-fire floods are a threat to property and critical facilities.

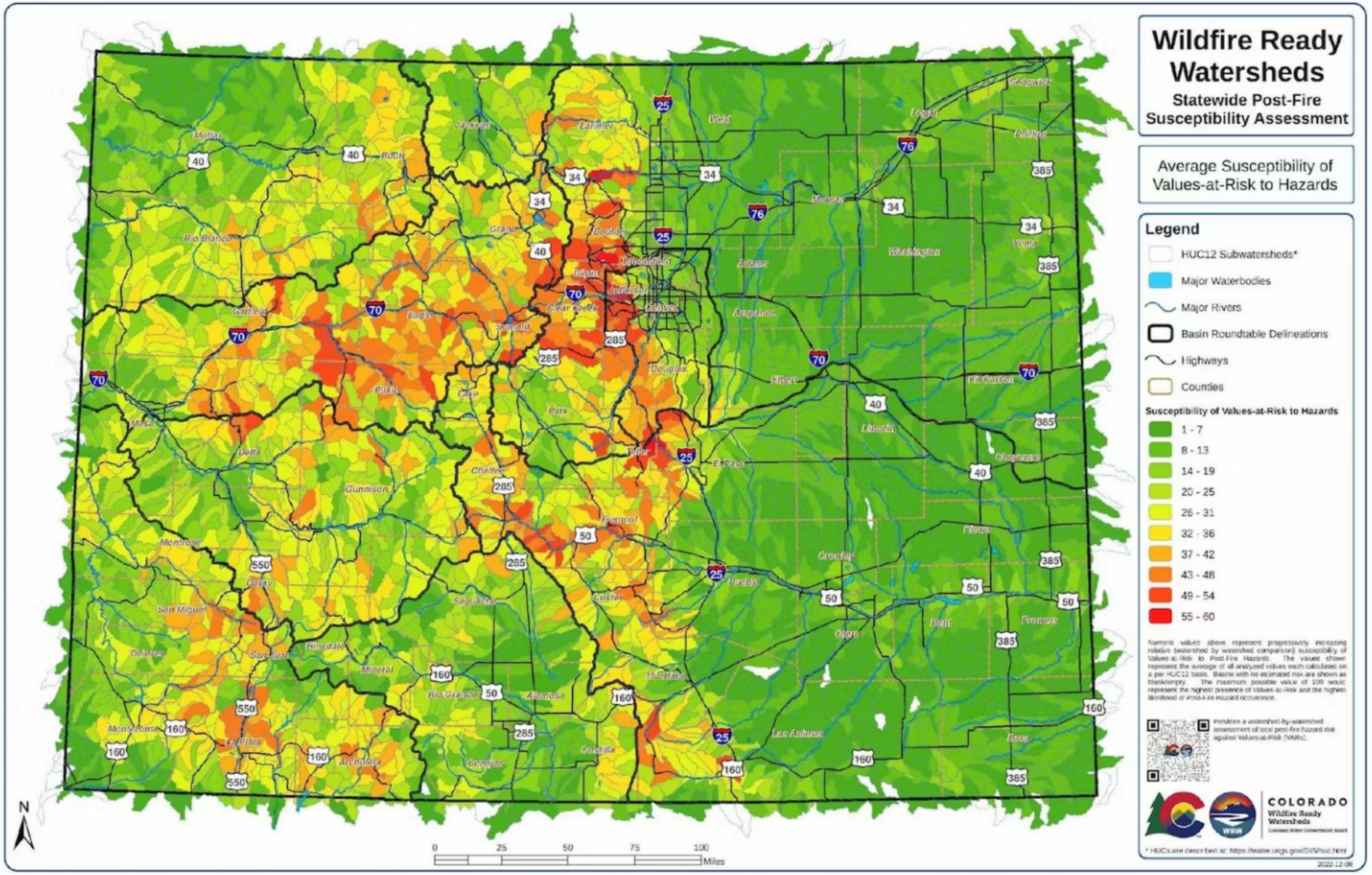
Provides an understanding of high consequence watersheds based on the number of structures at risk.

# Susceptibility

- VARs and Hazards are classified from 0-10.
- Highest values represent greatest presence of value or hazard.
- VAR and Hazard scores are intersected to generate overall risk score from 0-100.



# Wildfire Ready Watersheds

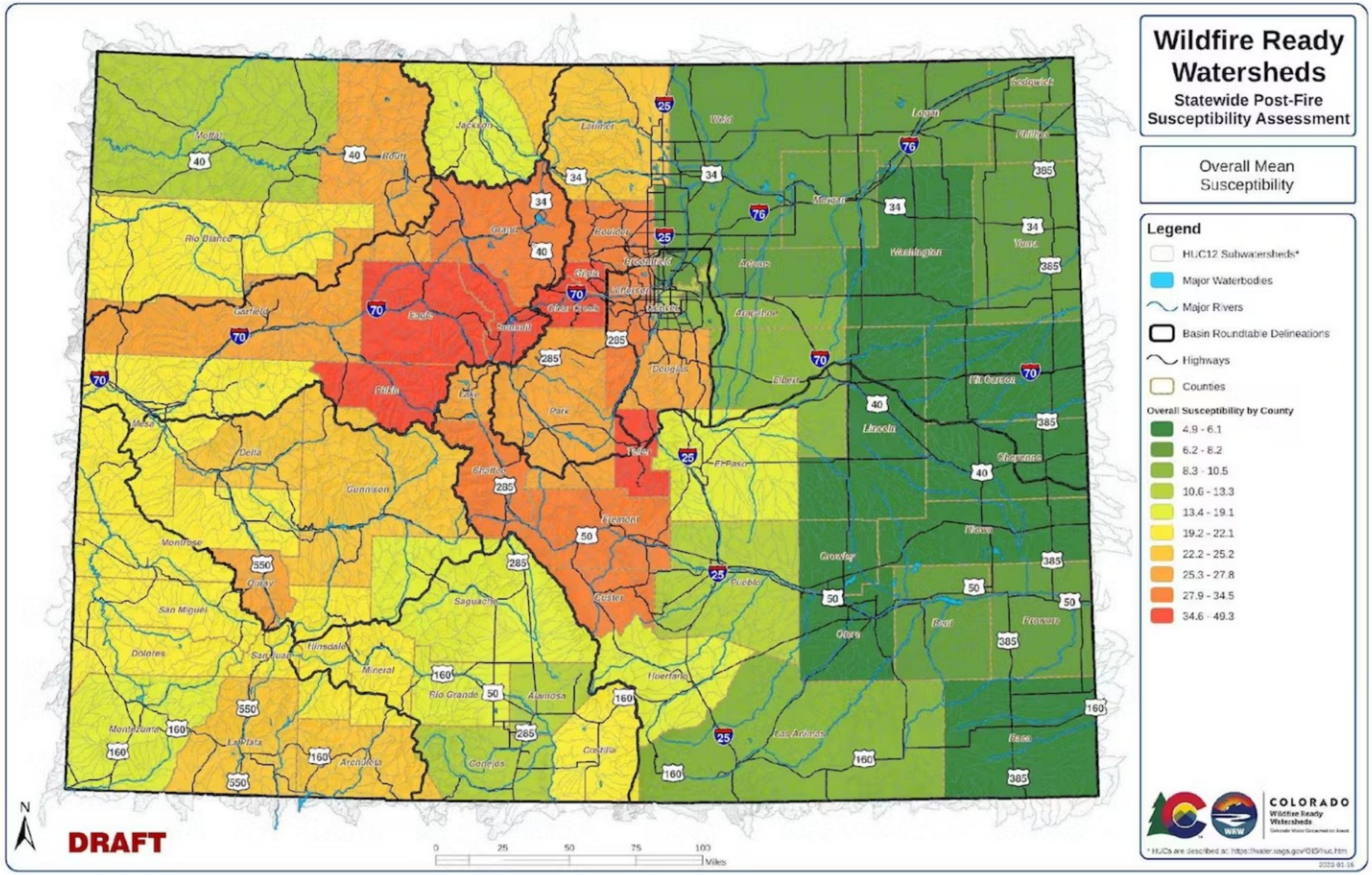



## Post-Fire Risk

Statewide relative risk for all values and post-fire hazards.

Map represents overall average susceptibility.

# Wildfire Ready Watersheds

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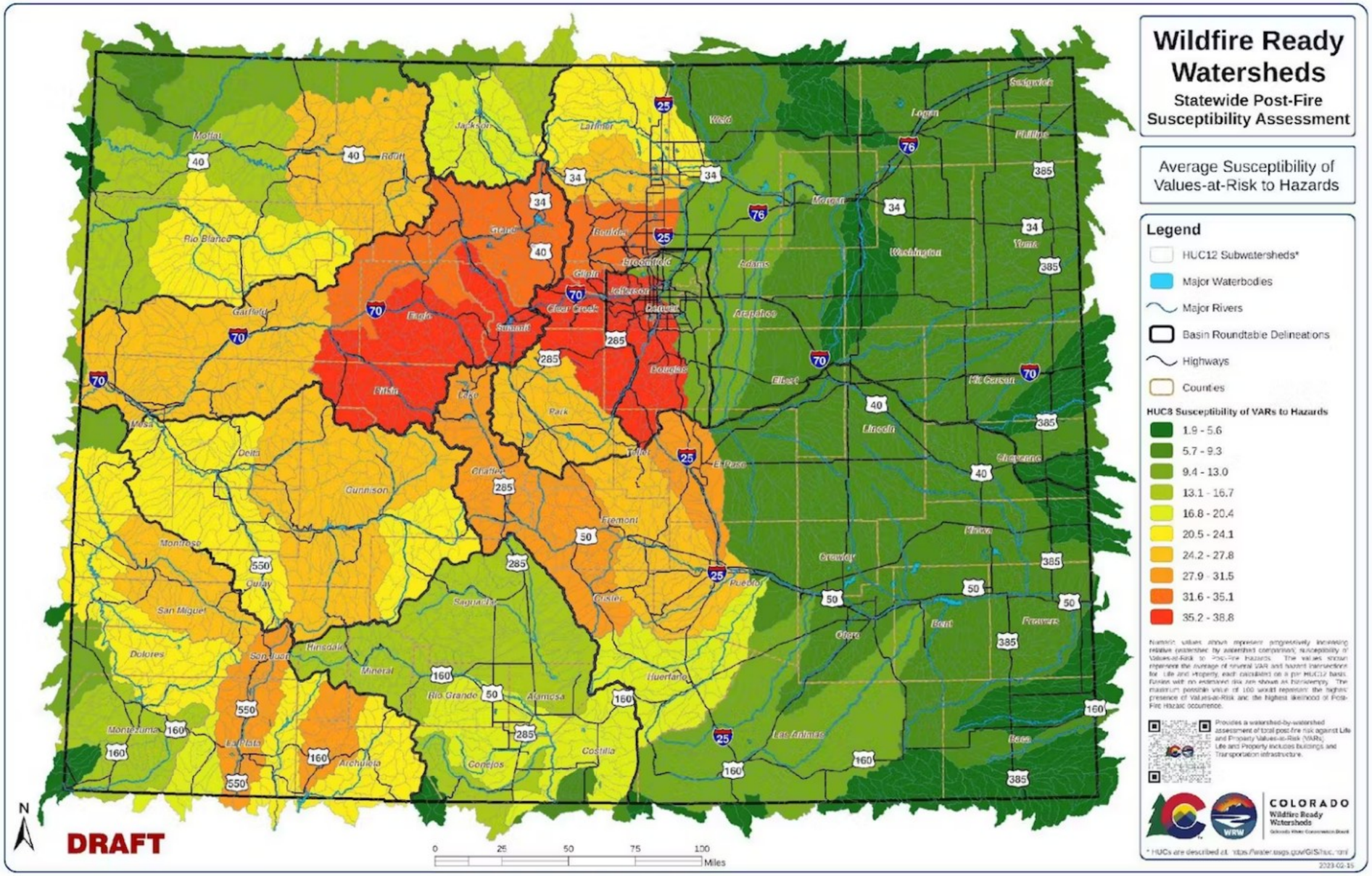
# Wildfire Ready Watersheds

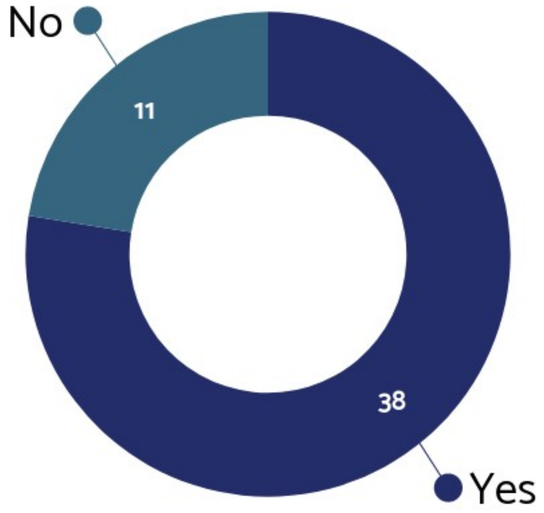



## Post-Fire Risk

Statewide relative risk for all values and post-fire hazards.

Map represents overall average susceptibility.

# Do you live or work in a county or watershed with moderate to high susceptibility?



# Wildfire Ready Watersheds

COLORADO
Wildfire Ready Watersheds
Colorado Water Conservation Board

# Statewide Post-Fire Susceptibility Explorer

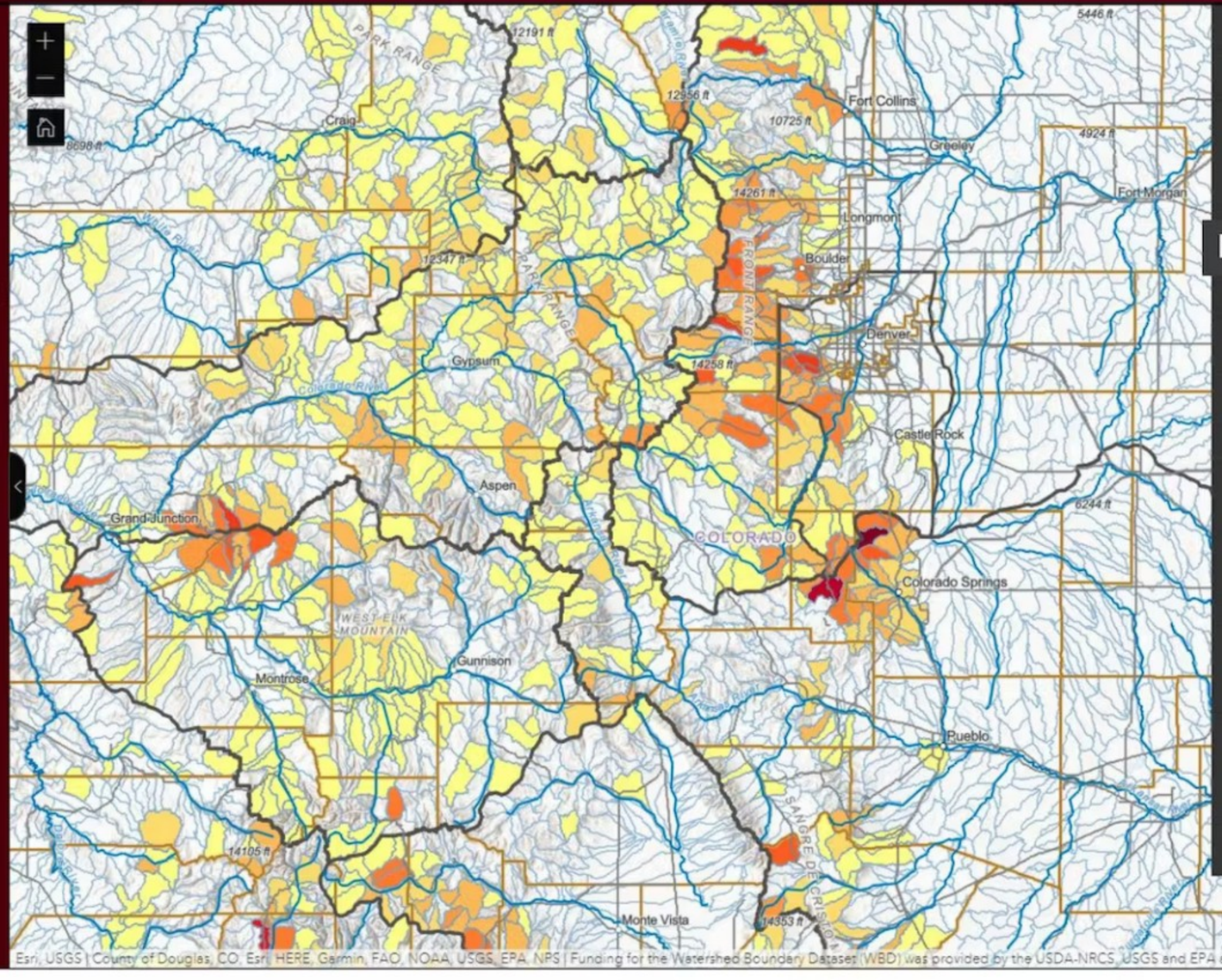
## Explore Your Susceptibility

The Wildfire Ready Watersheds (WRW) program seeks to assess the susceptibility of Colorado's watersheds to post-fire hazard risk in order to support development of pre-fire and post-fire mitigation plans, preparing communities and stakeholders for these impacts – before fires occur.

This web map provides an overview of the susceptibility mapping and associated analyses and evaluations performed to assess statewide susceptibility to post-fire hazards at a watershed (HUC-12) scale. This analysis was completed in three steps.

1. **Values-at-Risk (VAR) Identification.** This work curated available asset data classes at a statewide level and summarizes the relative presence of assets within any given HUC-12 watershed.
2. **Hazard Analysis.** Hazard analyses were collected or performed at a watershed scale for hydrologic change, post-fire flooding, sediment/hillslope erosion, and debris flow probability.
3. **Risk Assessment.** The risk assessment represents the intersection of VARs with hazards (risk = probability x consequence).

Learn More




Esri, USGS | County of Douglas, CO, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS | Funding for the Watershed Boundary Dataset (WBD) was provided by the USDA-NRCS, USGS and EPA along with other federal, state and local agencies. Representatives from m... Powered by Esri

- Reference Features
- Top Level Summaries - Values-at-Risk and Hazards
- Reservoirs
  - Reservoirs Susceptible to Hydrologic Change
  - Reservoirs Susceptible to Sedimentation

**Reservoirs Susceptible to Debris Flows**

- Built Flowlines (Ditches, Canals, and Pipelines)
- Decreed Features (Ditches, Ditch Systems, Pipeline, and Pump Points)
- Intake Watersheds (Sourcewater Assessment Areas)
- Aquatic Resources
- Roads Crossings (Intersections with Natural Flowlines

**Reference Features**

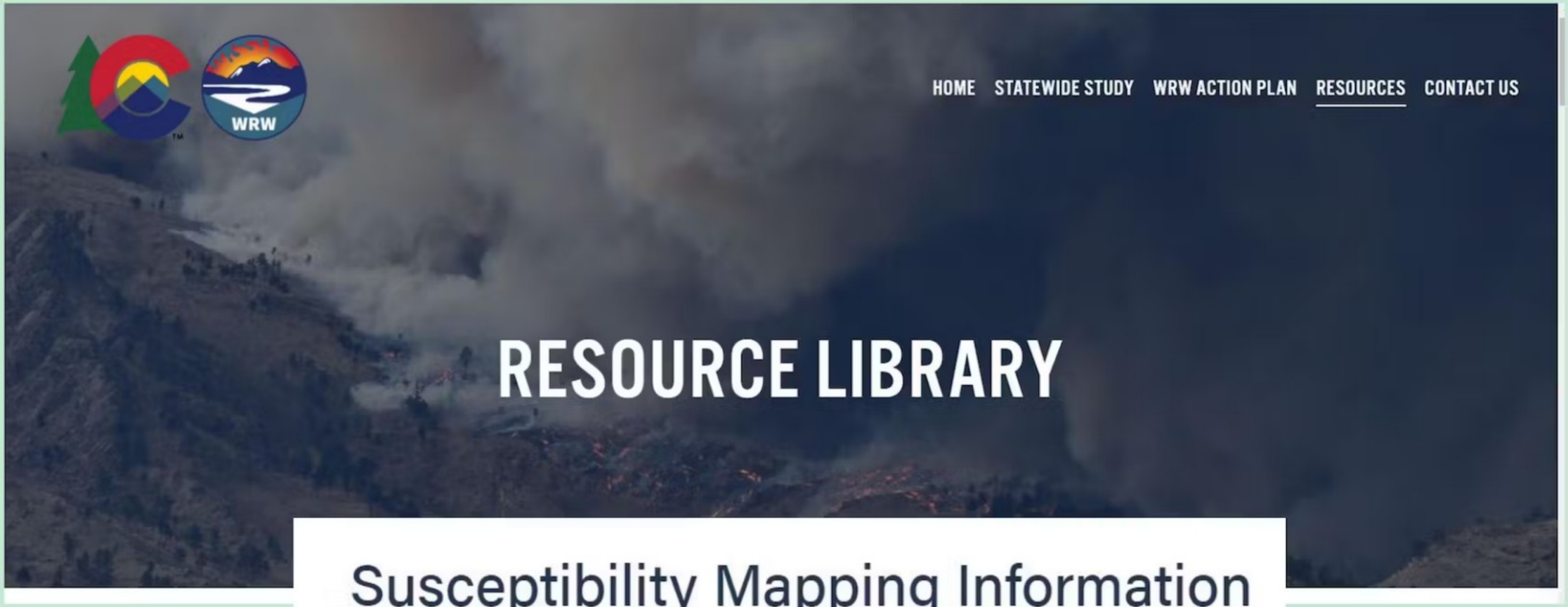
**Selected Rivers**

**CDOT Highways (State, US, and Interstate)**

**IBCC Basins**

**Counties**

# Wildfire Ready Watersheds




## Susceptibility Mapping Information

STATEWIDE SUSCEPTIBILITY MAPPING -DRAFT

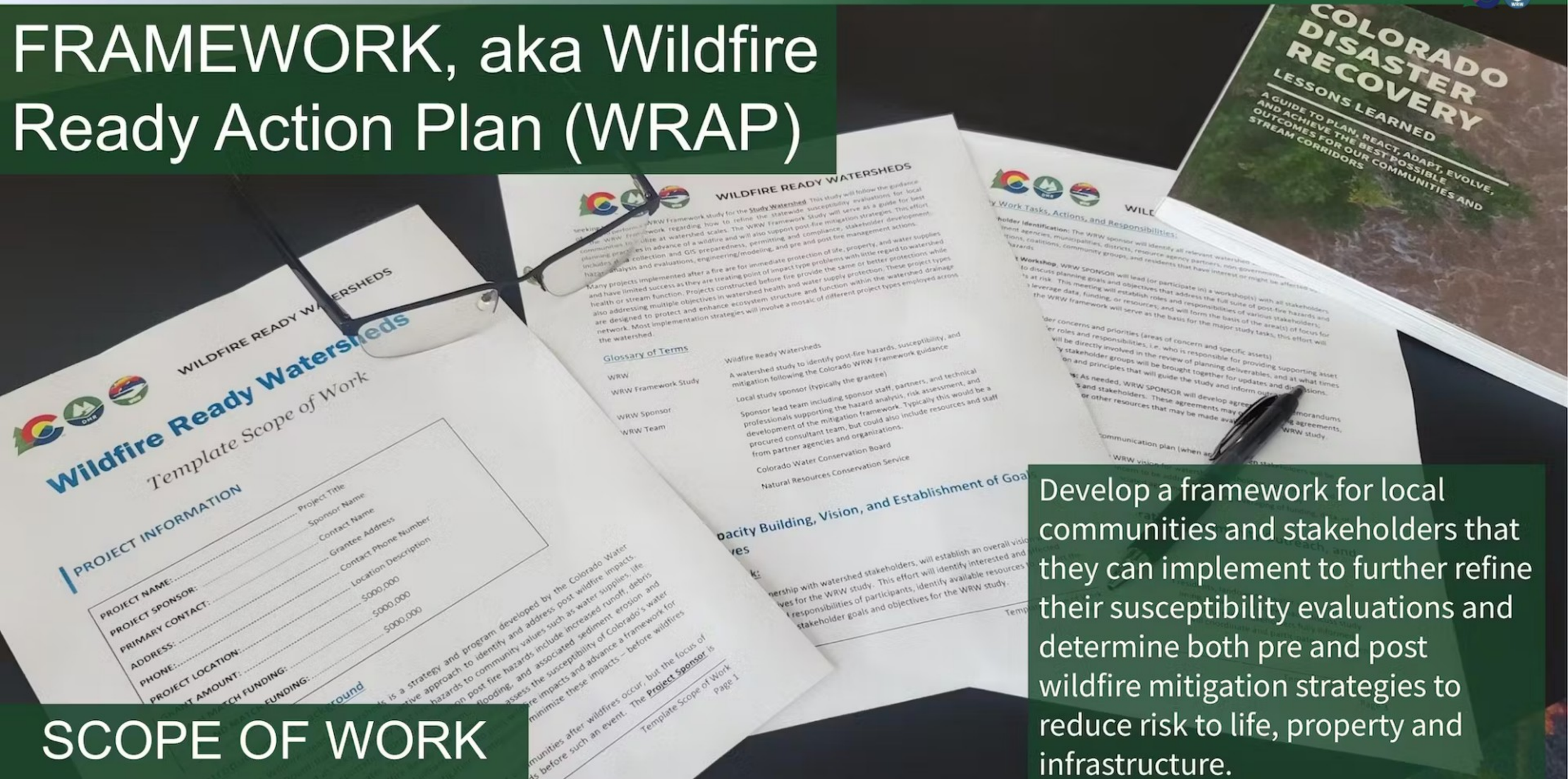
# FRAMEWORK

**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, aka Wildfire Ready Action Plan (WRAP)

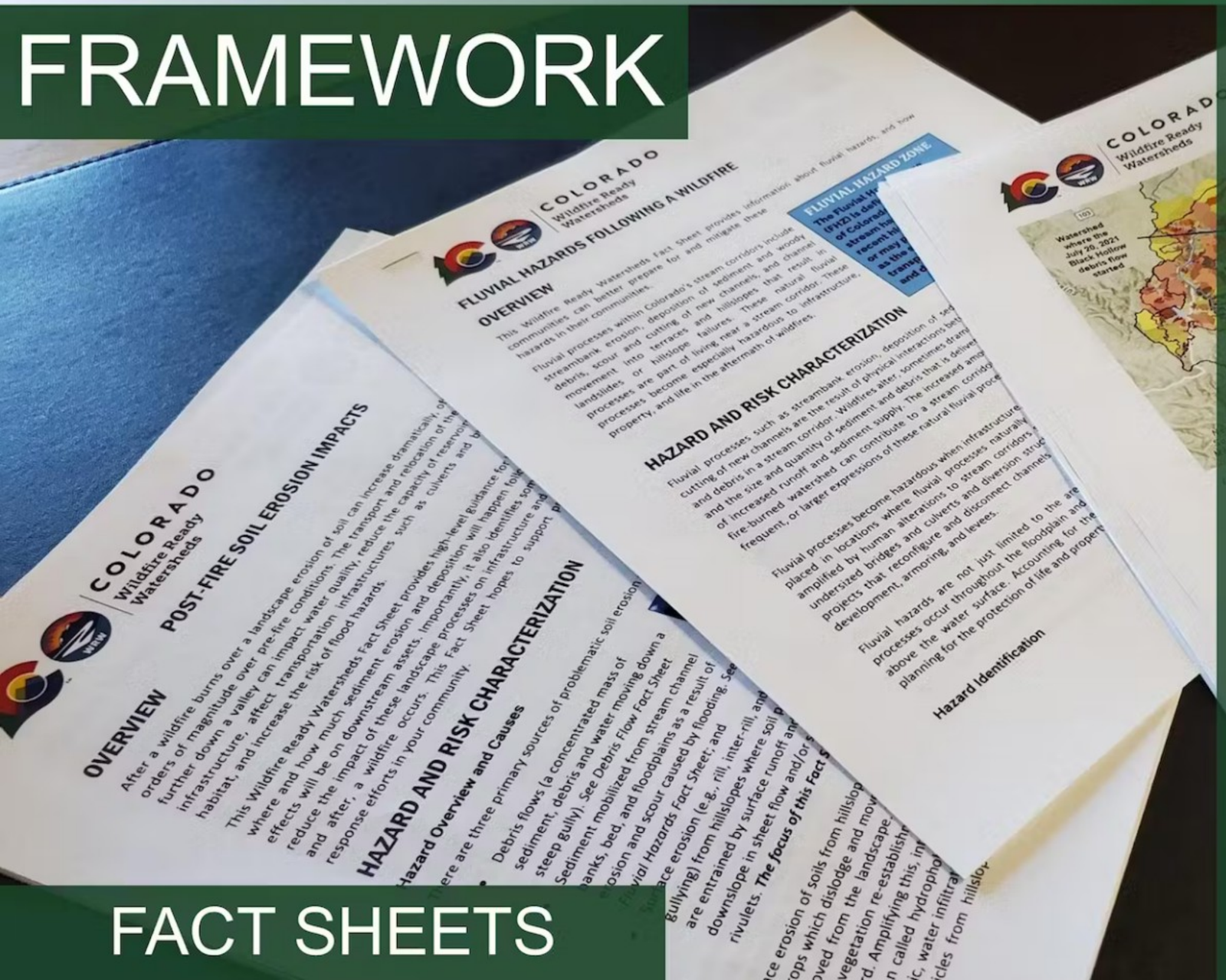



## SCOPE OF WORK

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

**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

# 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

# FRAMEWORK

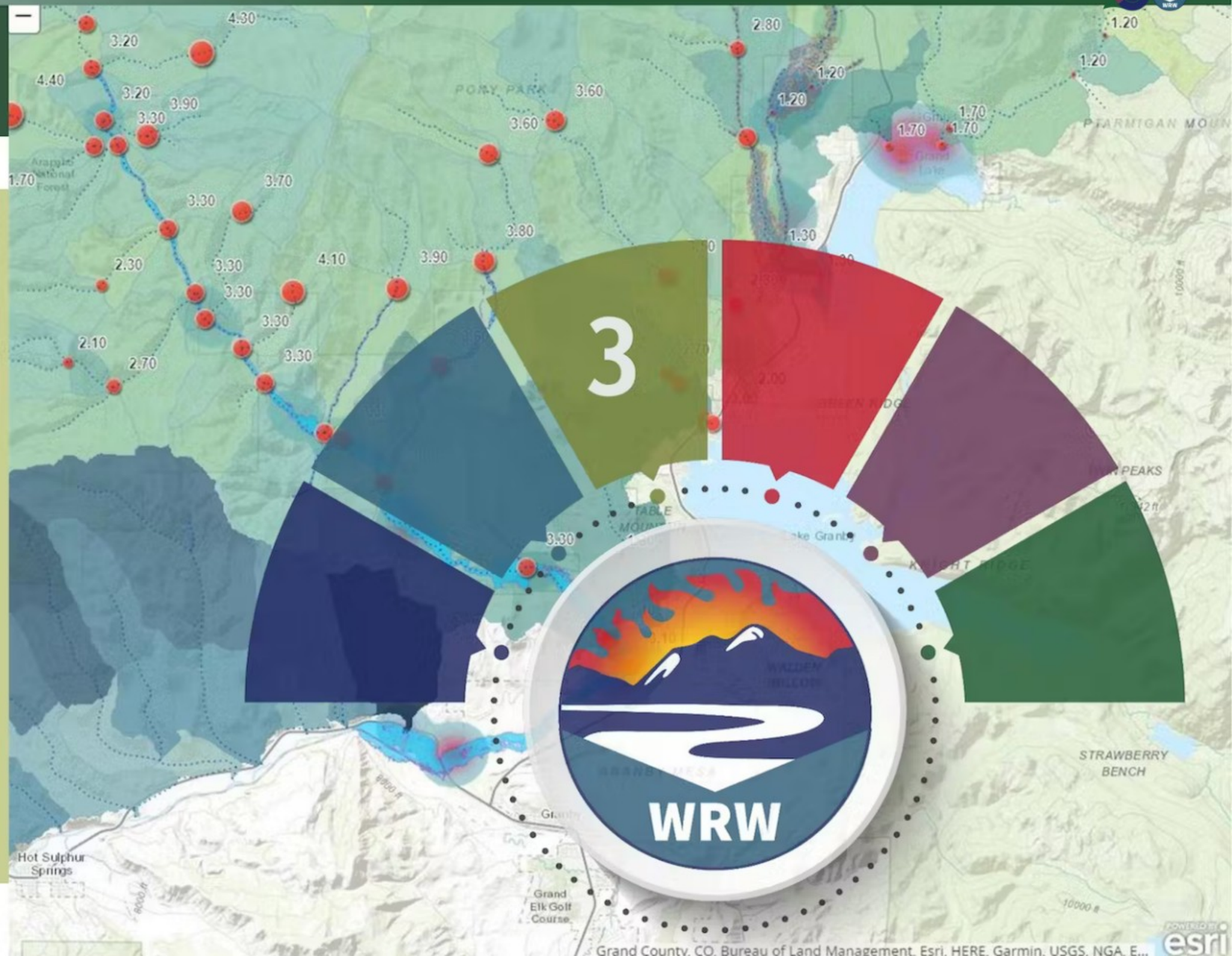
**Task 2:**
**Stakeholder Collaboration, Community Outreach, and Public Meetings**

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

# 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?)



# FRAMEWORK

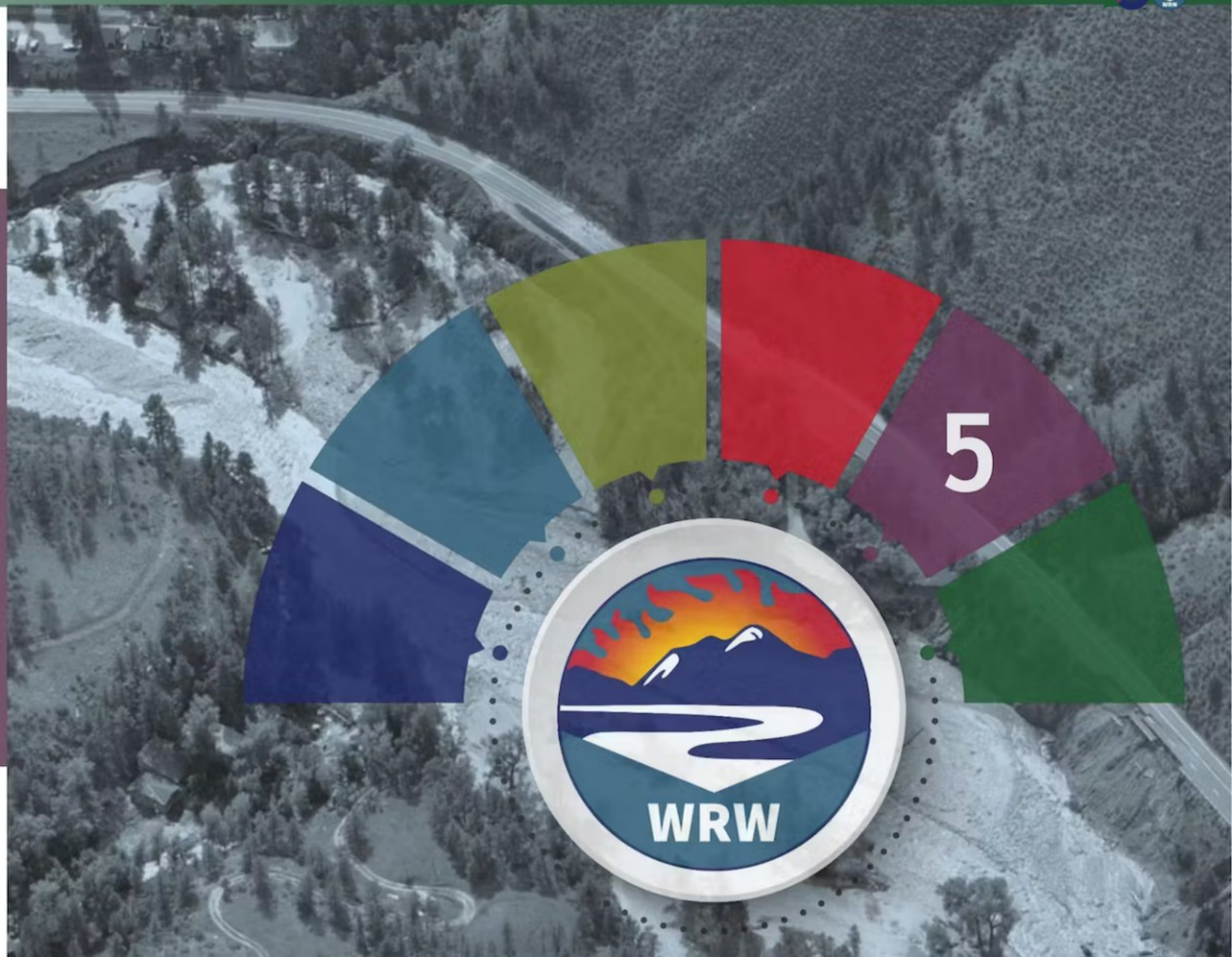
**Task 4:**
**Post Fire Hazard Analysis**

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

# 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

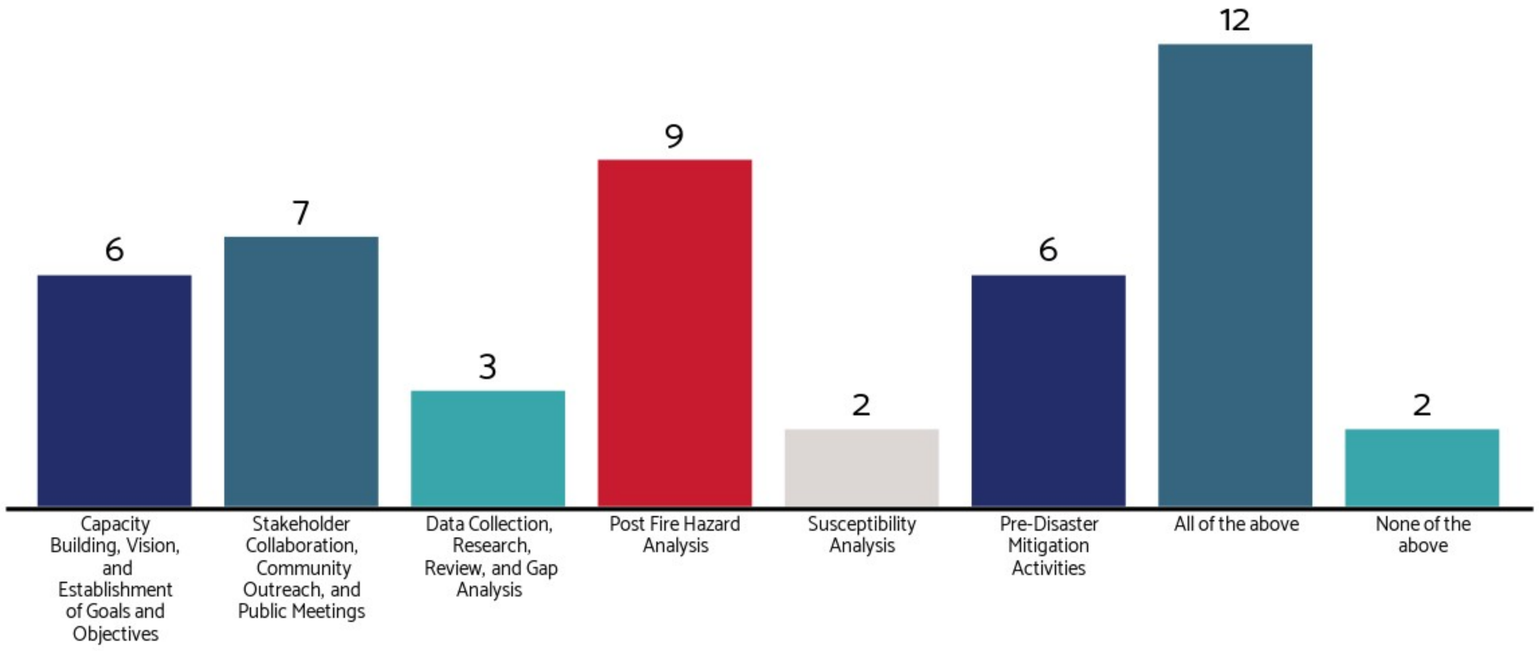


# FRAMEWORK

**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

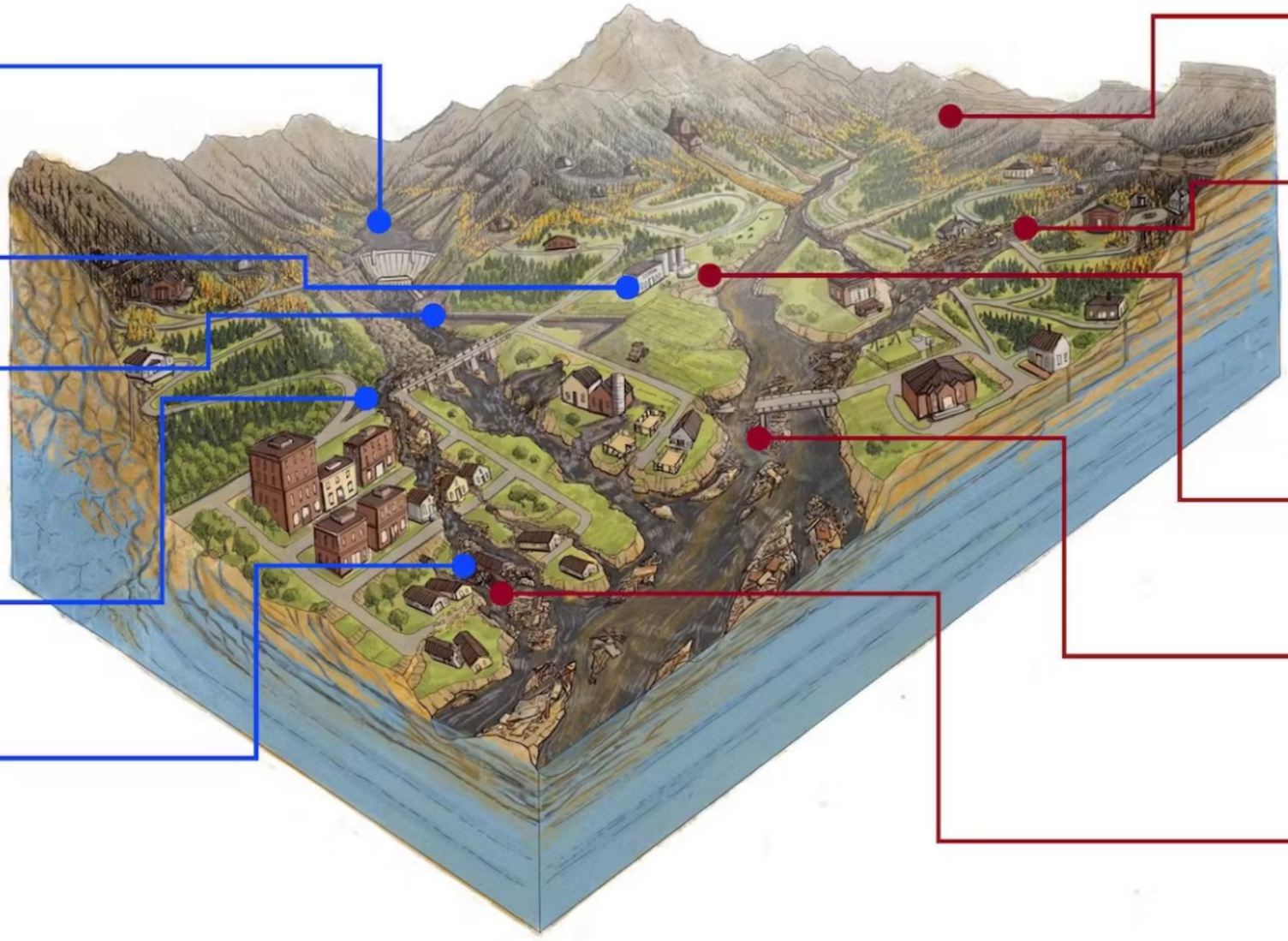
# Which task area best represents your area of expertise or primary interest?



# Wildfire Ready Watersheds

## VALUES AT RISK

- Reservoirs and Dams
- Municipal Water Intakes
- Ag Water Infrastructure
- Transportation Network
- Life and Property



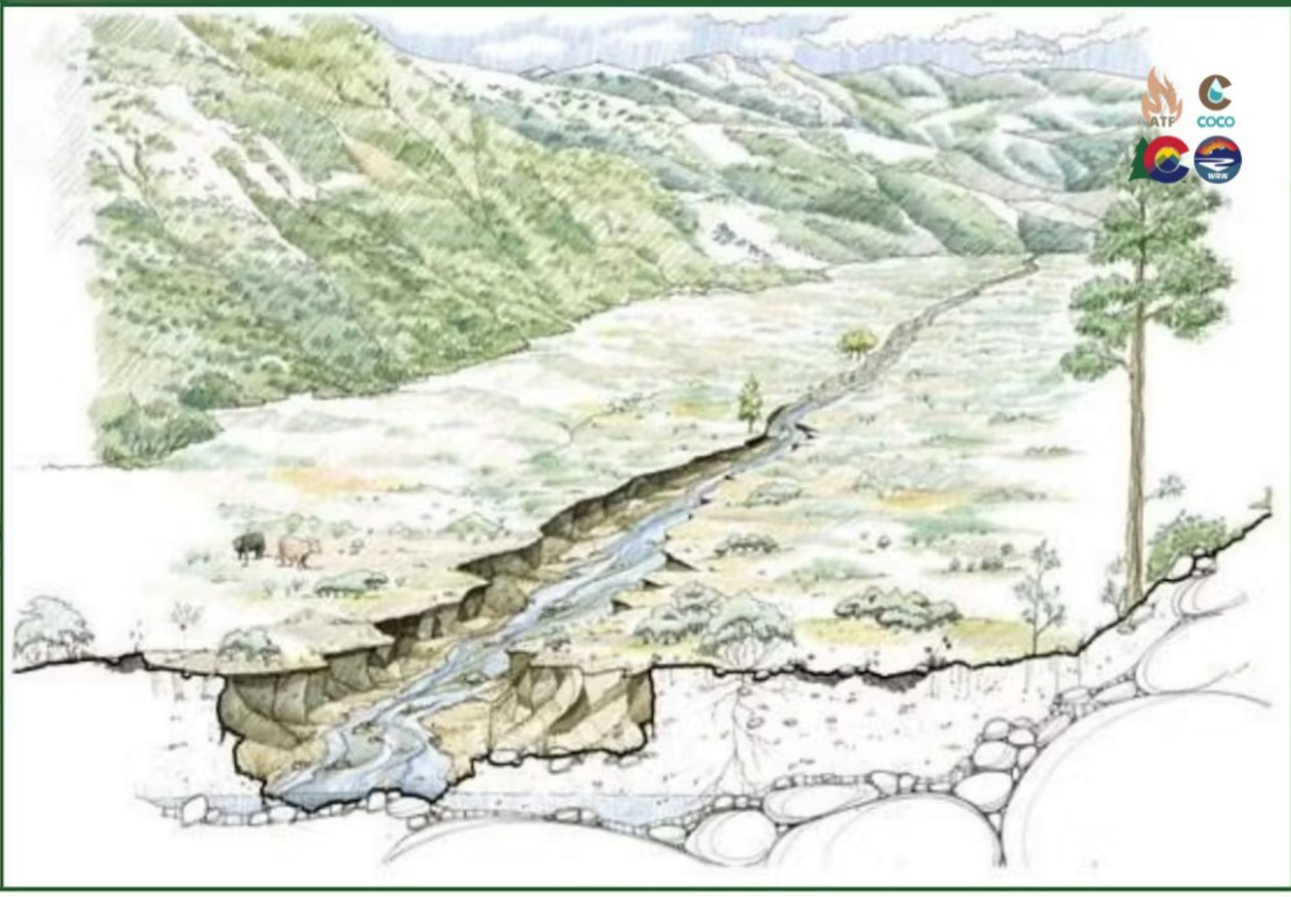
## HAZARDS

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

# Wildfire Ready Watersheds


"No, he's not busy. ... In fact, that whole thing is just a myth."

# Wildfire Ready Watersheds



***Healthy Meadow:*** *Factors of a pristine meadow include: meadow hydrology, soils and vegetation and interdependent; diverse mosaic of habitat with wet meadow and riparian vegetation; surface flow from snowmelt; high water table; inundation during floods with sediment deposition and attenuated flood flows; subsurface flow of snowmelt; and percolation with groundwater recharge.*

***Unhealthy Meadow:*** *Factors of a degraded meadow include: reduced natural storage of water; lowering of groundwater table; flood flows confined to channel with no inundation during floods; disconnect of channel from meadow floodplain; reduced percolation; xeric (or dry) vegetation; incised stream channel with increased sediment transport; and compacted soils.*

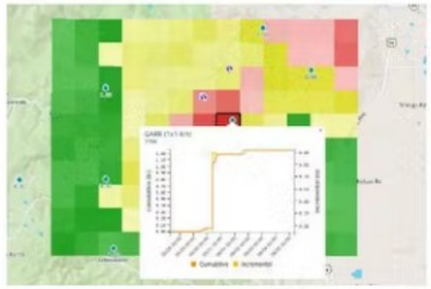
**Images and text from National Park Service** **Nps.gov/yose/learn/nature/meadow-health.htm**

# MITIGATION


Protect and Restore Natural Infrastructure
Natural buffers that protect communities and assets from wildfires and post fire impacts.

# Wildfire Ready Watersheds

# ALERT SYSTEMS



Today 8:19 PM

Moderate: Rule "CalWood PreVieux Alert - 0.50 in/hr " has triggered a notification. 13 of 130 locations are forecast to pass the threshold of 0.5 in/h at 06/25/2021 20:28 MDT.

vip.vieuxinc.com/alerts/31?p=calwood

Moderate: Rule "Upper Central Gulch - 2 Foot Stage Threshold" has triggered a notification. 1 of 1 watchpoints is forecast to pass the threshold of 2.0 ft at 06/25/2021 22:35 MDT.

vip.vieuxinc.com/alerts/36?p=calwood

Photo Credit: Katie Jagt, Black Hollow Debris Flow, Cameron Peak Fire

# Wildfire Ready Watersheds

## Website

www.wildfirereadywatersheds.com

Questions?

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COLORADO
Colorado Water Conservation Board
Department of Natural Resources

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

# THANK YOU

Questions?

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Colorado Water Conservation Board
Department of Natural Resources

# Questions and Comments

21 questions

2 upvotes

# Thank You

A recording of this webinar will be available at AfterTheFlames.com. You will also receive a follow-up email of the recording with links to any resources shared.