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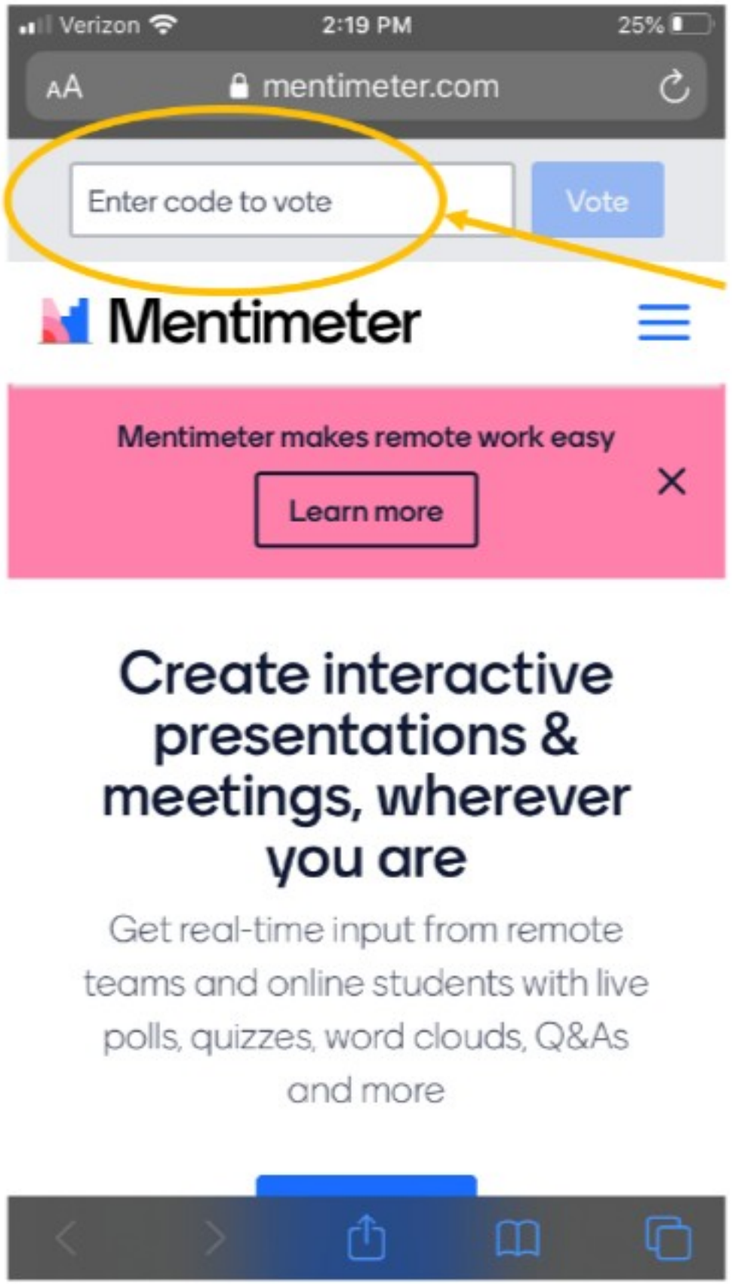
American Rivers, Colorado River District, Saint Vrain and Left Hand Water Conservancy District, San Luis Valley Water Conservancy District, Vranesh and Raisch



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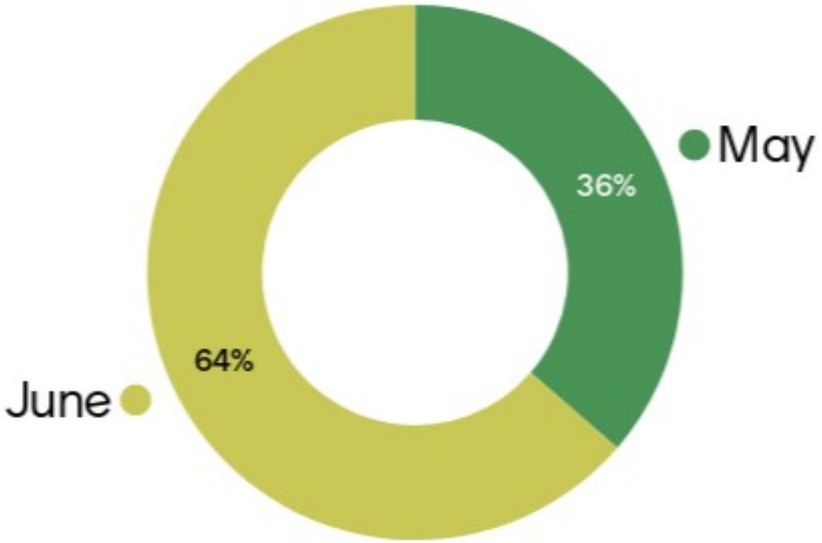
Colorado's Drought Task Force and Phase 2 of the State Drought Mitigation and Response Plan was activated in what month of 2020?



Planning the Fluvial Futur

Making the Most of Fluvial Hazard Zone Maps

Sustaining Colorado Watersheds: - 2020

- Chris Sturm, Colorado Water Conservation Board
- Michael Blazewicz, Round River Design
- Katie Jagt, Watershed Science and Design
- Joel Sholtes, University of Colorado, WASH Engineering

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wash
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CWCB's mission is

"to conserve, develop, protect, and manage Colorado's water for present and future generations"

Water Uses =

Environmental
Agricultural
Municipal
Industrial
Recreational

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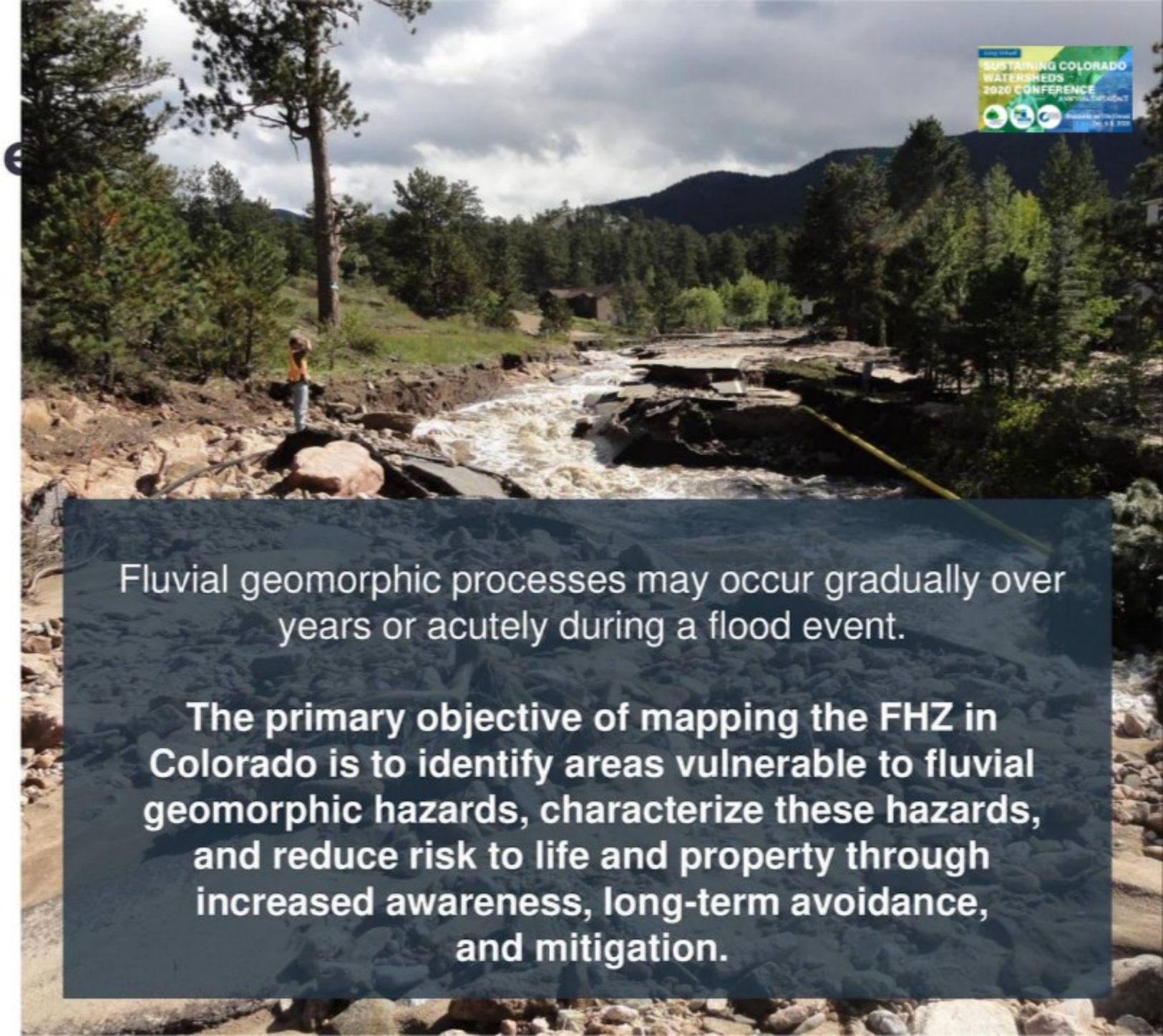
Fluvial Hazard Zone

The Fluvial Hazard Zone (FHZ) is the area a stream has occupied in recent history, may occupy, or may physically influence as it stores and transports water, sediment, and debris.



Fluvial geomorphic processes may occur gradually over years or acutely during a flood event.

The primary objective of mapping the FHZ in Colorado is to identify areas vulnerable to fluvial geomorphic hazards, characterize these hazards, and reduce risk to life and property through increased awareness, long-term avoidance, and mitigation.

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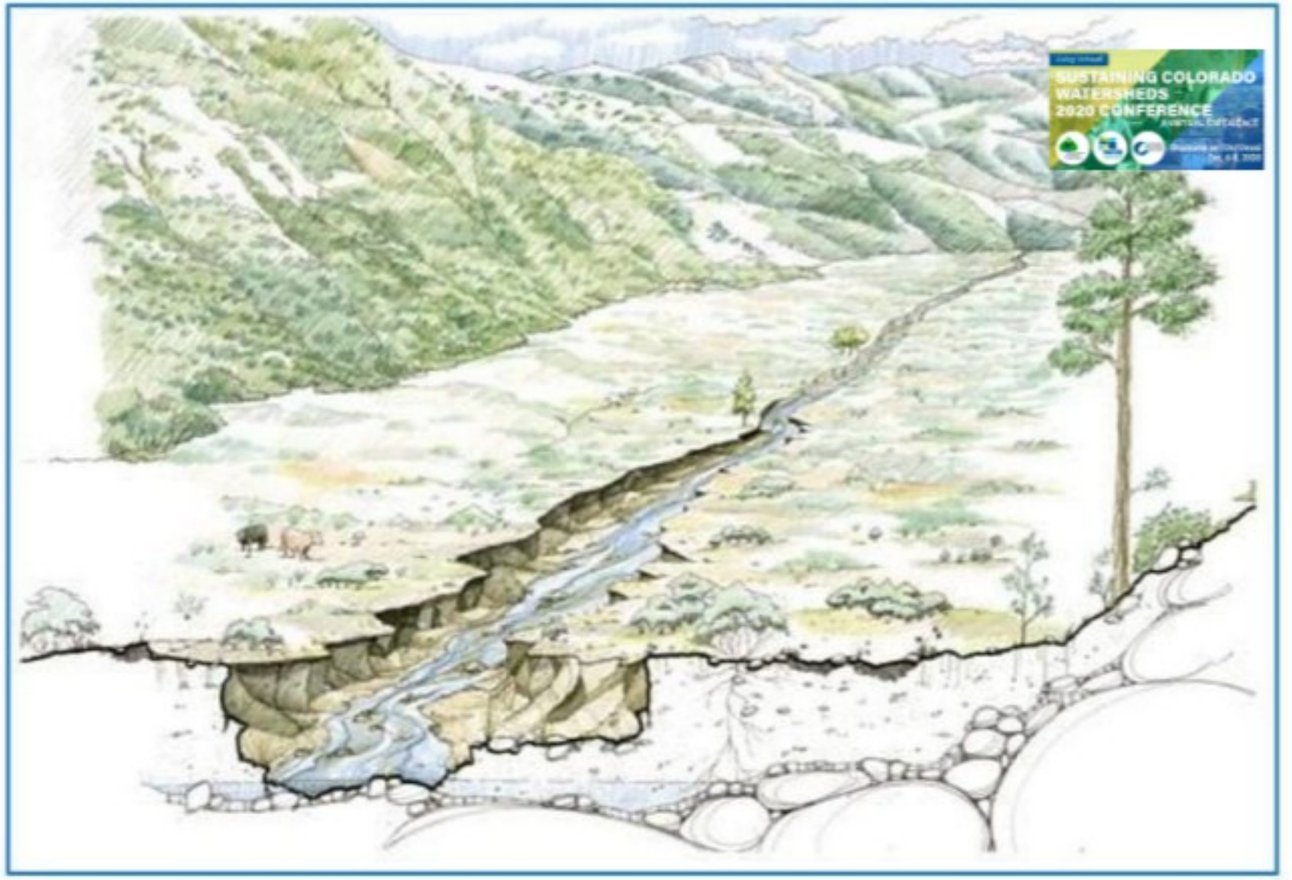
Additional Objectives of Fluvial Hazard Mapping

- Increase awareness of natural stream processes.
- Support stream planning and management on a watershed scale.
- Support long-term restoration of stream function and floodplain connection.
- Strategize watershed-scale sediment and debris management.
- Preserve the multitude of benefits provided by open space along stream corridors.

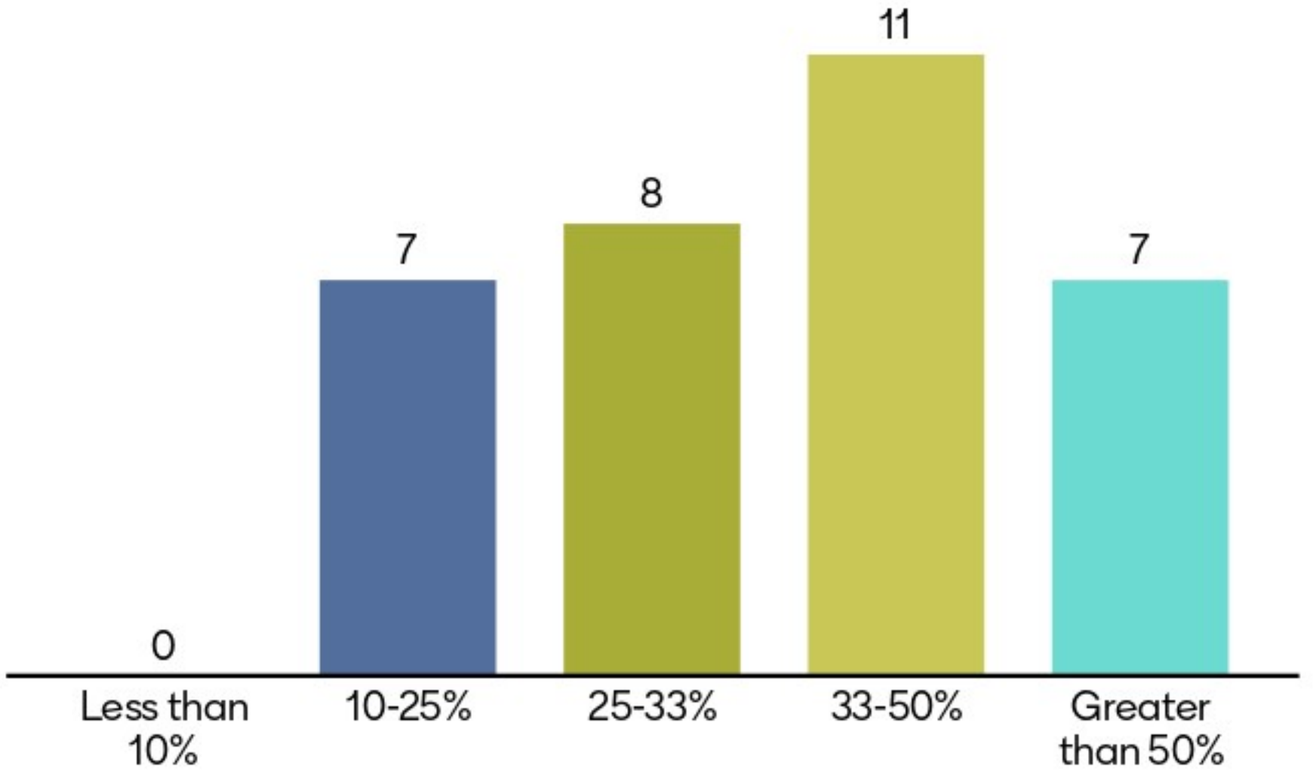
Healthy Meadow: *Factors of a pristine meadow include: meadow hydrology, soils and vegetation and interdependent; diverse mosaic of habitat with wet meadow and riparian vegetation; surface flow from snowmelt; high water table; inundation during floods with sediment deposition and attenuated flood flows;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

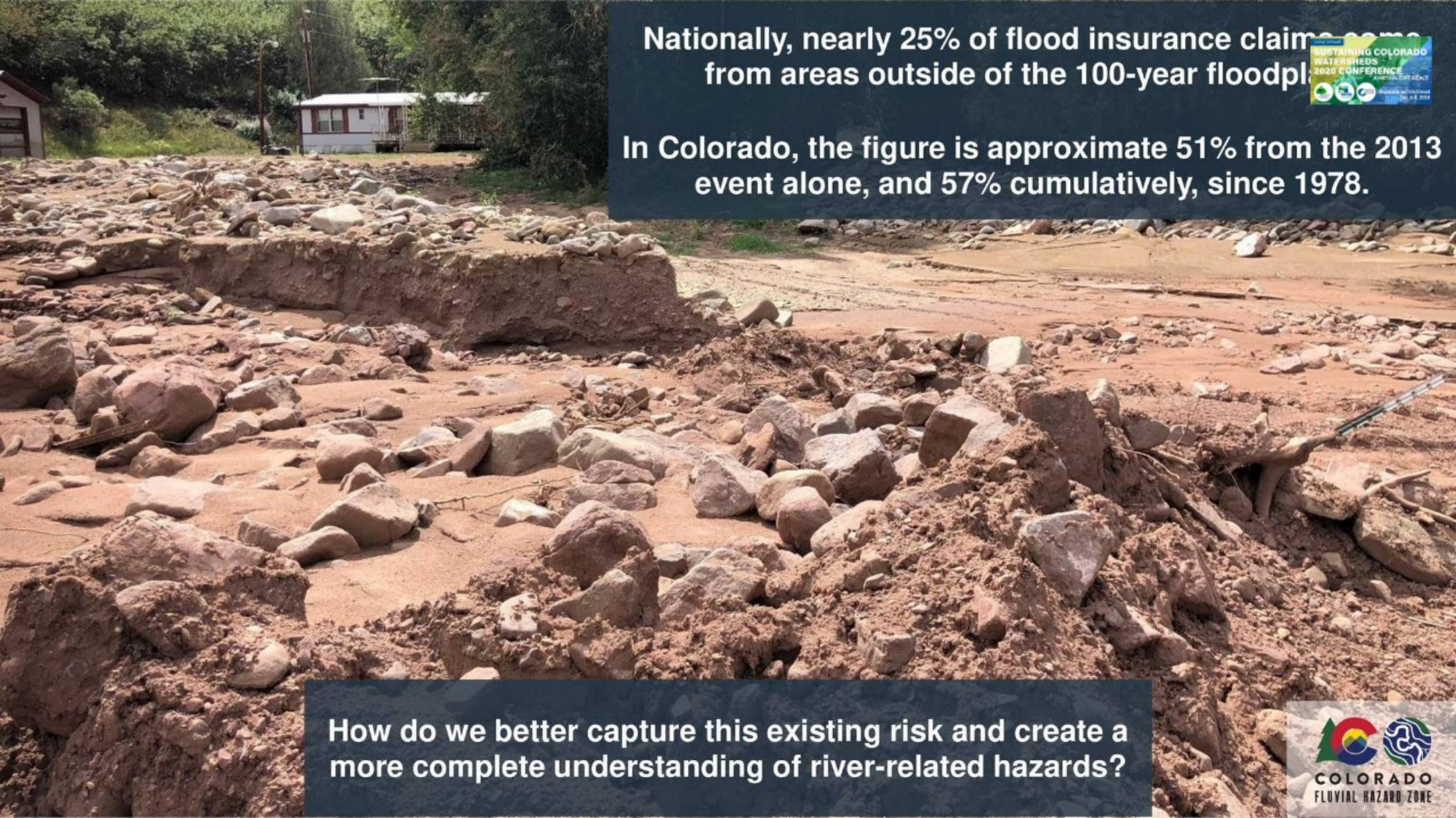


Unhealthy Meadow: *Factors of a degraded meadow include: reduced natural storage of water; lowering of groundwater table; flood flows confined to channel with no inundation during floods; disconnect of channel from meadow floodplain; reduced percolation; xeric (or dry) vegetation; incised stream channel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

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

In Colorado, what percentage of flood insurance claims come from outside the area identified as the 100-year floodplain?




Nationally, nearly 25% of flood insurance claim
from areas outside of the 100-year floodpl
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In Colorado, the figure is approximate 51% from the 2013 event alone, and 57% cumulatively, since 1978.
How do we better capture this existing risk and create a more complete understanding of river-related hazards?
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Fluvial Hazard Zones

vs

Floodplain Inundation Models and Maps

FHZ

Colorado FLUVIAL HAZARD ZONE Delineation Protocol

1.0

AUGUST 2020

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Department of Natural Resources

DNR

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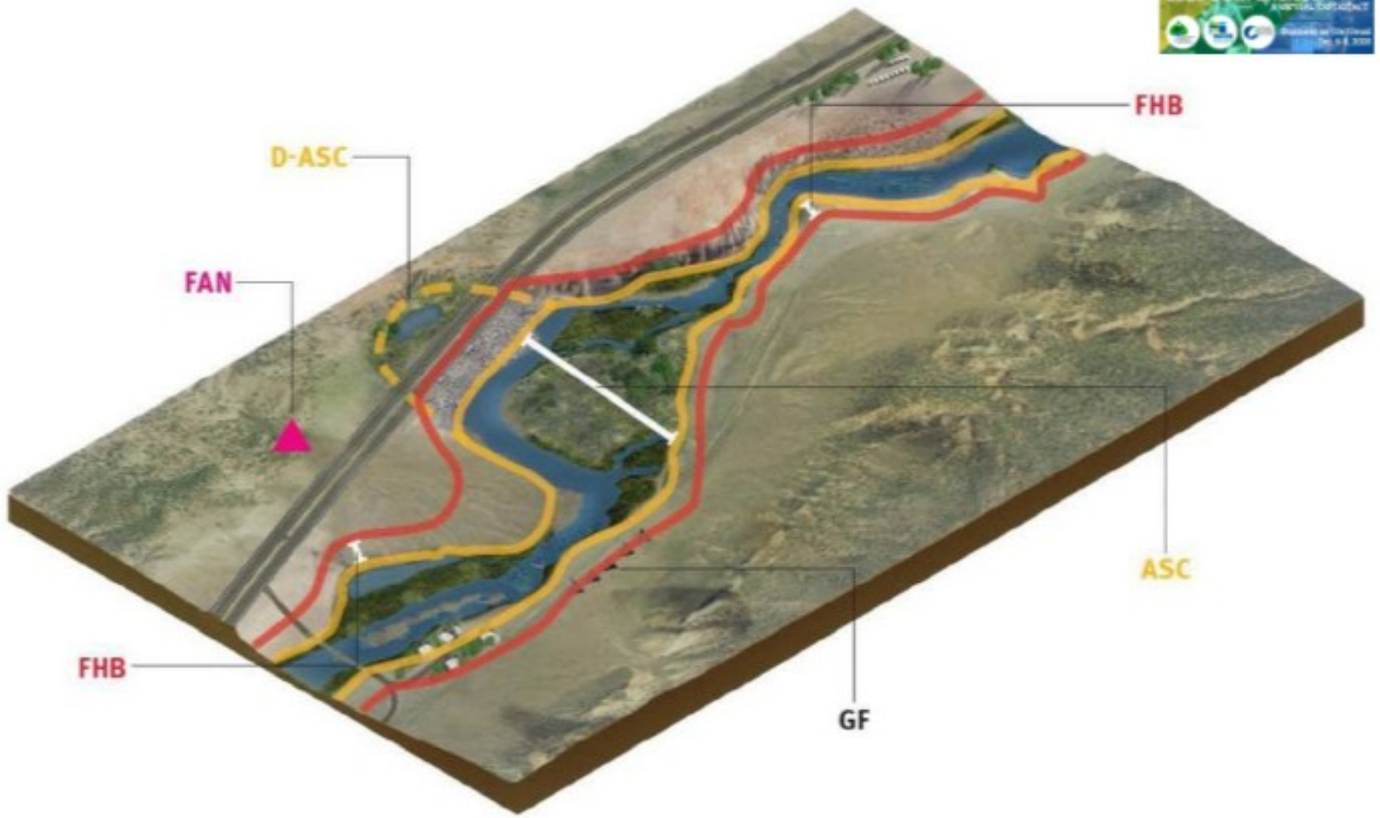

- Active Stream Corridor (ASC) } Primary components
- Fluvial Hazard Buffer (FHB) } Primary components
- Avulsion Hazard Zone (AHZ)—Not Shown
- Fan (F)
- Geotechnical Flag (GF)
- Disconnected Active Stream Corridor (D-ASC)

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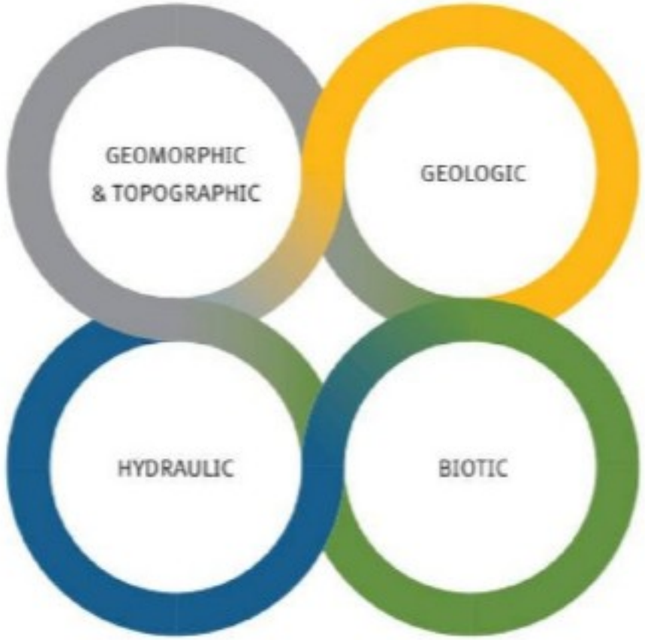
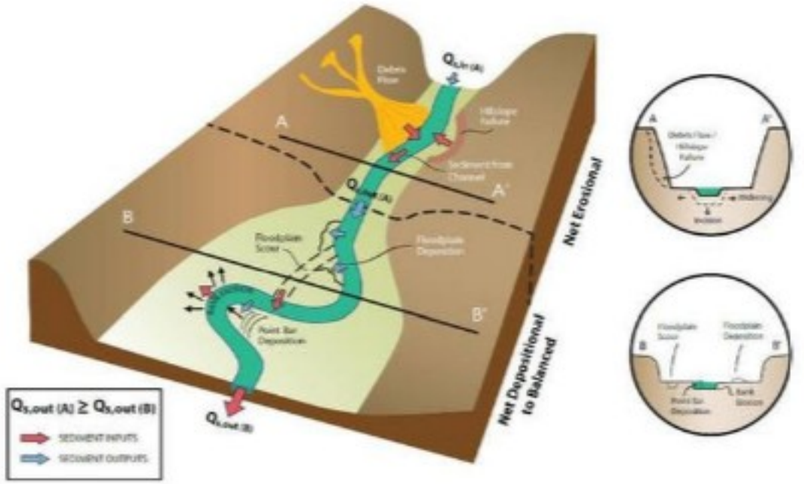
Process-Based = FHZ

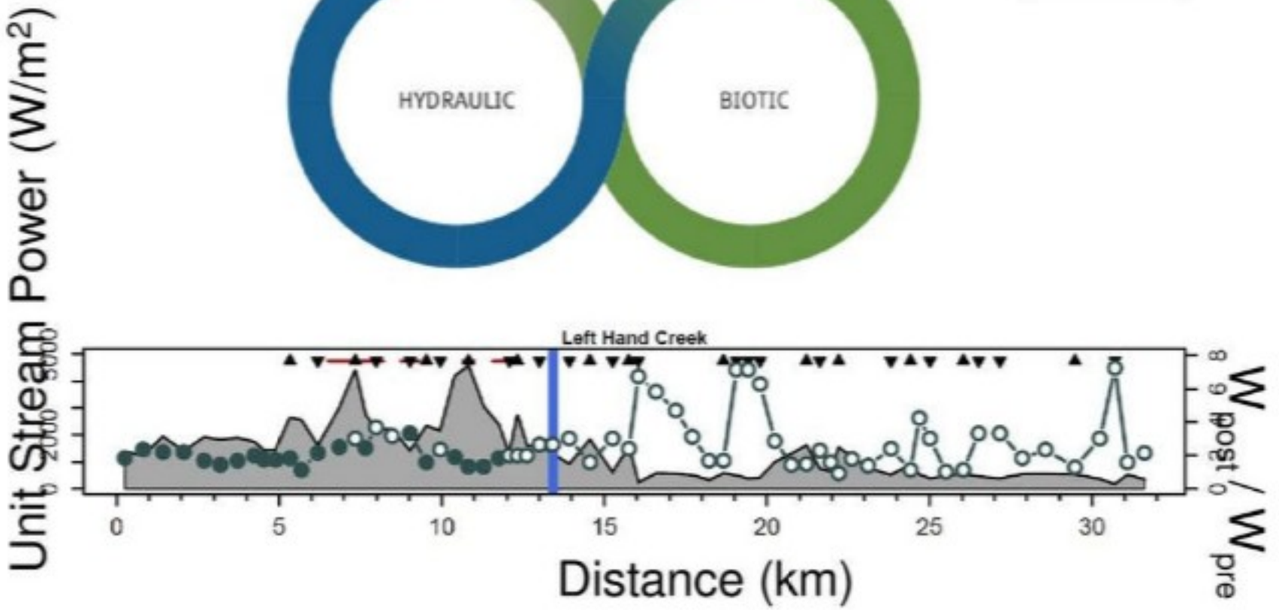
Energy Flow and Dissipation



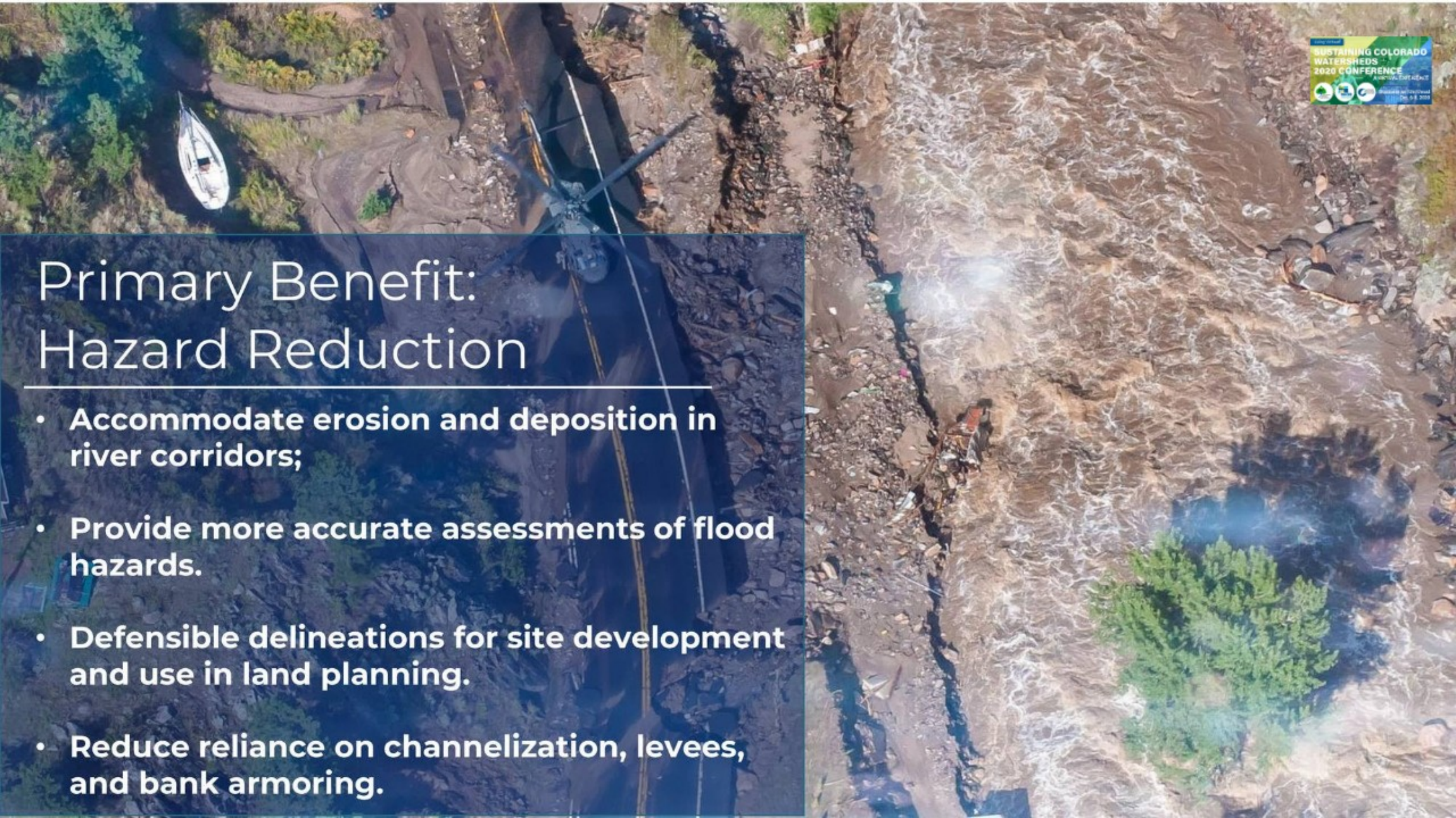
Sediment Continuity



Stream Power and Geomorphic Response to Floods



COLORADO FLUVIAL HAZARD ZONE



Primary Benefit: Hazard Reduction

- **Accommodate erosion and deposition in river corridors;**
- **Provide more accurate assessments of flood hazards.**
- **Defensible delineations for site development and use in land planning.**
- **Reduce reliance on channelization, levees, and bank armoring.**

Secondary Benefit: Resilient Infrastructure

- **Identify at-risk infrastructure and critical facilities within FHZ**
- **Avoid FHZ when repairing and replacing**
- **Site new infrastructure in less hazardous areas within river corridor**
- **Reduce maintenance and repair costs**

Secondary Benefits: Wildfire

- **Provide space for erosion and sediment deposition after a wildfire.**
- **Provide natural fire breaks possibly aiding a community's firefighting response.**

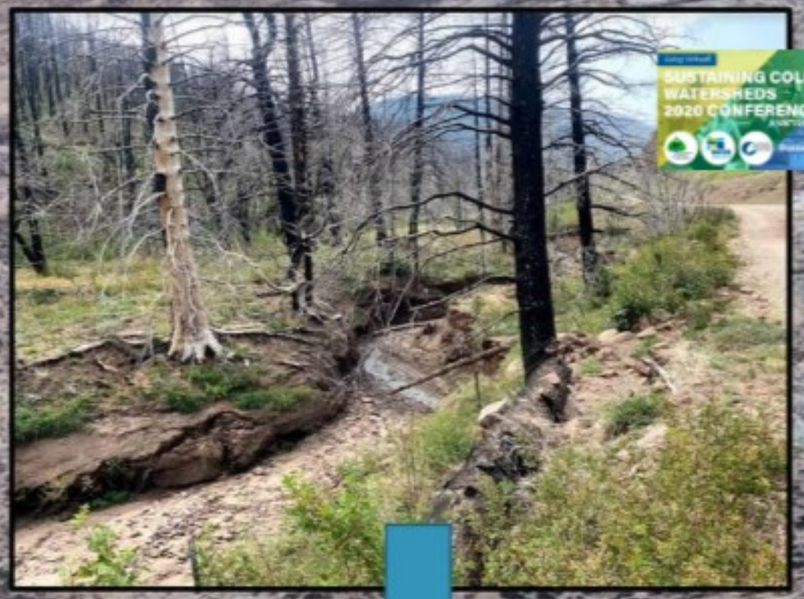
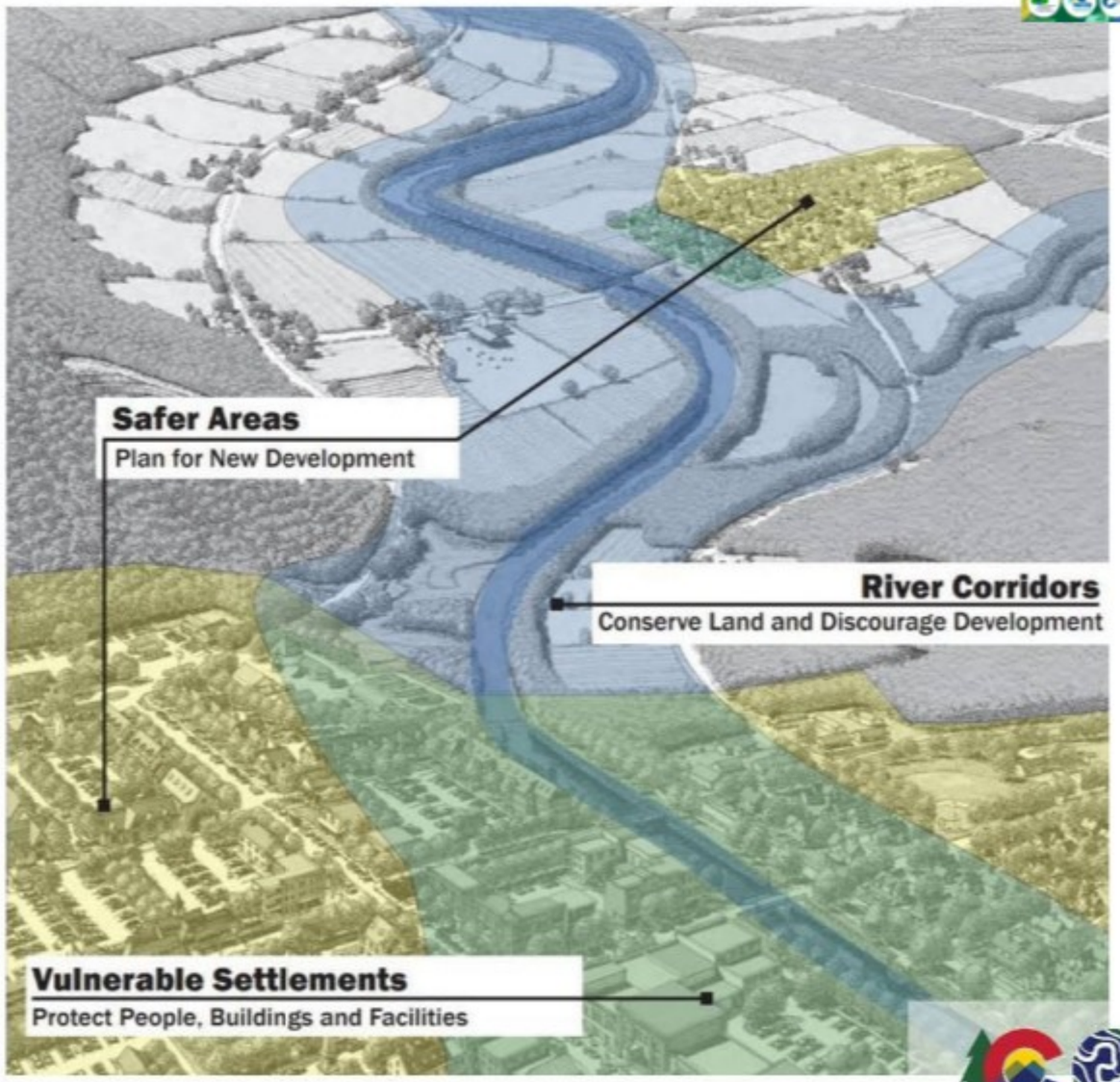


Photo: Joe Wheaton

Planning the Fluvial Future: Tools for Your Community

Incorporate FHZ Concepts into Planning

- Comprehensive (or master) plan
- Local hazard mitigation plans
- Pre-disaster recovery plans
- Emergency response plans
- Emergency response planning
- Wildfire planning
- Parks and open space plans
- Capital improvement plans
- Drainage and stormwater; infrastructure/transportation; stream corridor; water resource planning; stream management plans



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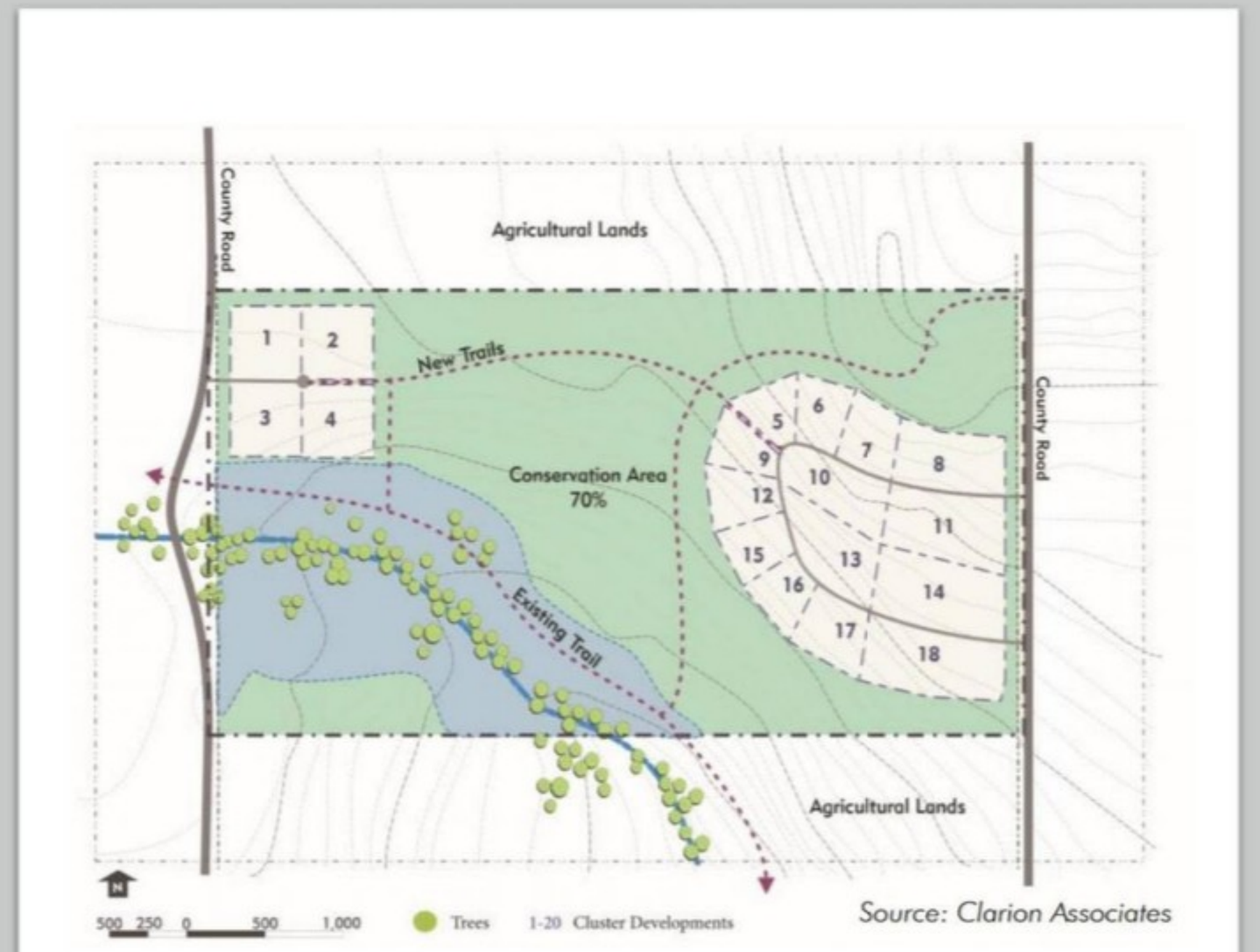

Incentivize Development Outside of FHZ

- Development agreements (e.g., density bonuses)
- Cluster subdivisions
- Transfer of development rights
- Conservation easements (e.g., stream corridor easement)
- Land acquisition

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FLUVIAL HAZARD ZONE

Incentivize Development Outside of FHZ

Incorporate into Regulatory Mechanisms

- Overlay zoning
- Comprehensive recovery ordinances
- Community rating system (CRS)

FLUVIAL HAZARD ZONE (FHZ) OVERLAY DISTRICT MODEL ORDINANCE V. 1.0
August 2020

Model Fluvial Hazard Zone Overlay District Ordinance

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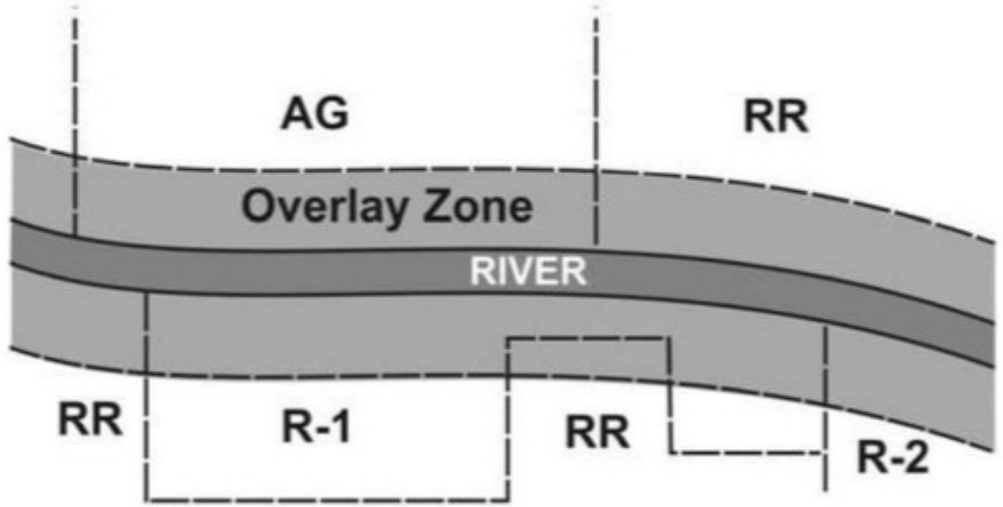

Graphic by John Warbach, Planning & Zoning Center, Inc.

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Aftermath of 2013 flood in Jamestown, CO. Source - Michael Rieger, FEMA

Enhance Local Administration & Procedures

- Development application submittal requirements
- Post-disaster moratorium

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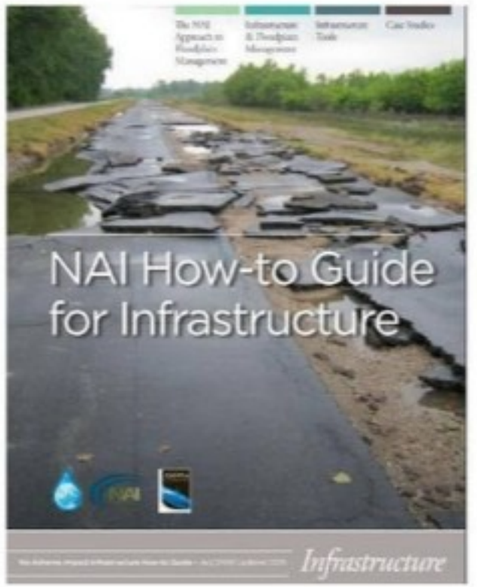
Promote Actions to Mitigate Hazards

- No Adverse Impact Standards
- Identify critical areas
- Provide opportunities for relocation or buyouts



U.S. Flood Strategy Shifts to 'Unavoidable' Relocation of Entire Neighborhoods

Using tax dollars to move whole communities out of flood zones, an idea long dismissed as radical, is swiftly becoming policy, marking a new and more disruptive phase of climate change.

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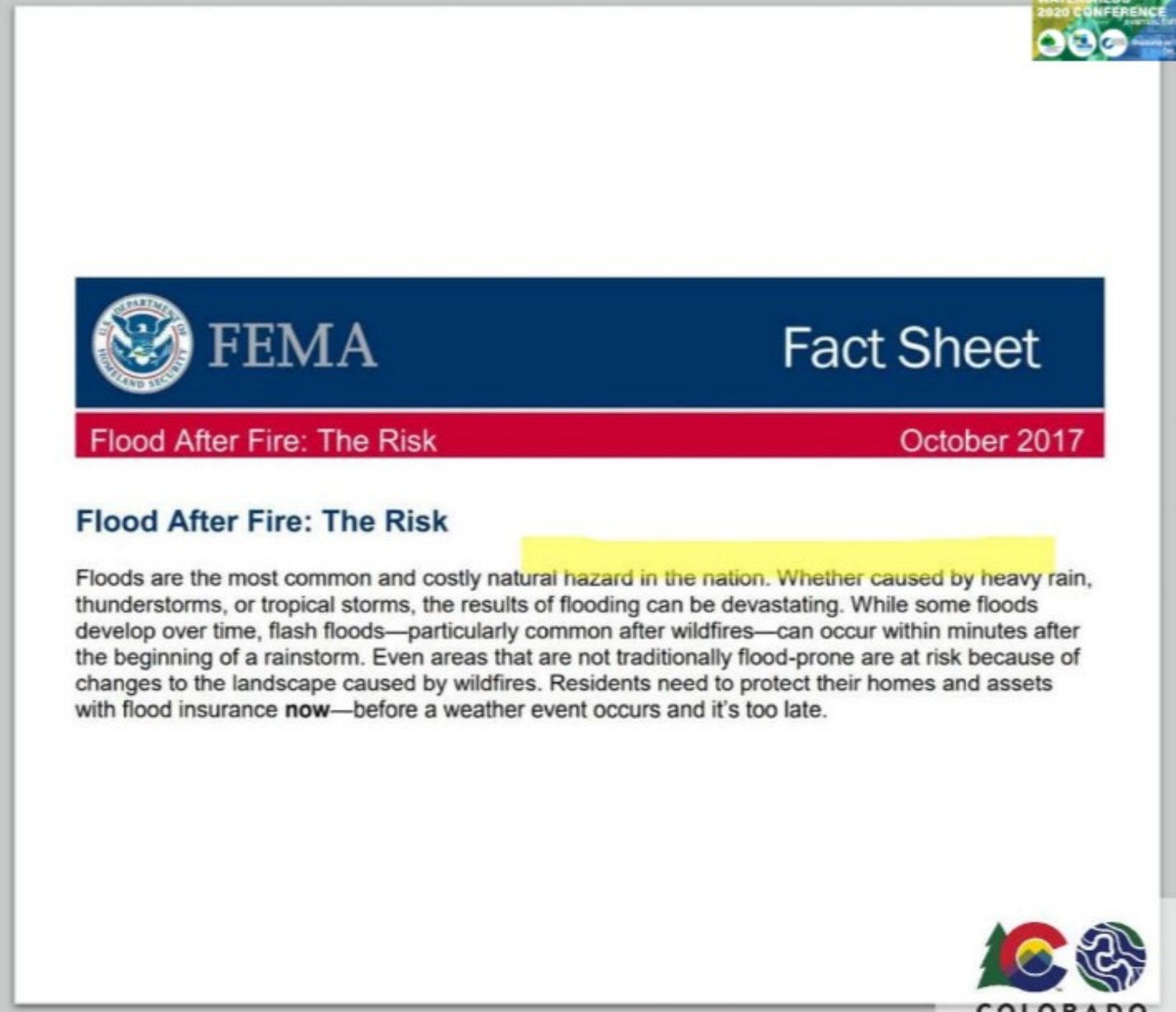
Create Opportunities to Inform Community

- Provide the FHZ as an information layer on NFIP maps
- Incorporate FHZ's into utility connections and septic permit reviews
- Encourage the purchase of flood insurance in the FHZ
- Incorporate fluvial hazard information onto community websites
- Incorporate fluvial processes and hazards into school education
- Partner with local watershed organizations



FEMA Fact Sheet

Flood After Fire: The Risk October 2017

Flood After Fire: The Risk

Floods are the most common and costly natural hazard in the nation. Whether caused by heavy rain, thunderstorms, or tropical storms, the results of flooding can be devastating. While some floods develop over time, flash floods—particularly common after wildfires—can occur within minutes after the beginning of a rainstorm. Even areas that are not traditionally flood-prone are at risk because of changes to the landscape caused by wildfires. Residents need to protect their homes and assets with flood insurance **now**—before a weather event occurs and it's too late.

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Resources:

www.ColoradoFHZ.com

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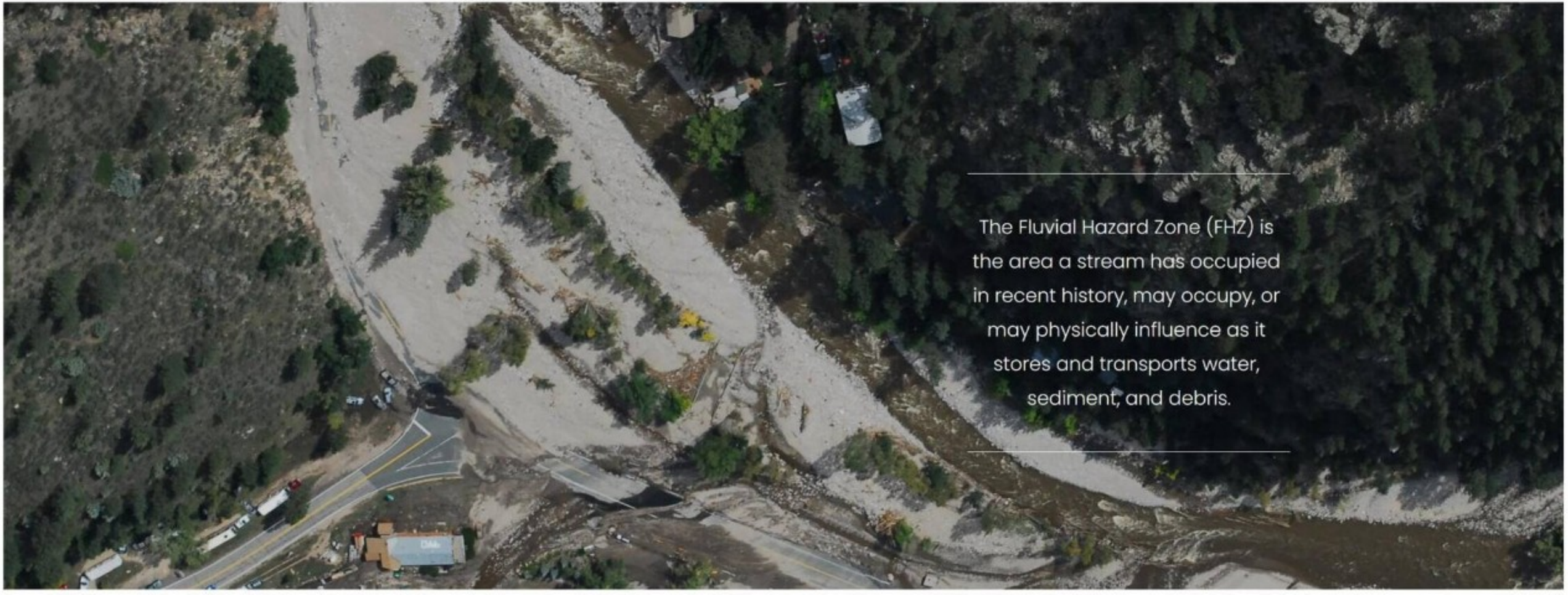


FHZ Documents and Tools

FHZ Fact Sheet

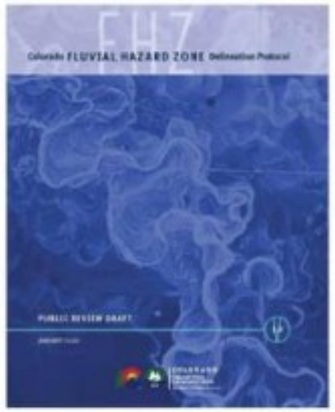
The FHZ Fact Sheet is an introduction to the concepts of fluvial hazards, the CWCB program developed to identify them, and provides an explanation as to how FHZ maps differ from FEMA floodplain maps.

Quickstart Guide

This document provides communities, agencies, and organizations with guidance on how FHZ mapping can be incorporated into planning, disaster response, administration, and regulation (if applicable).

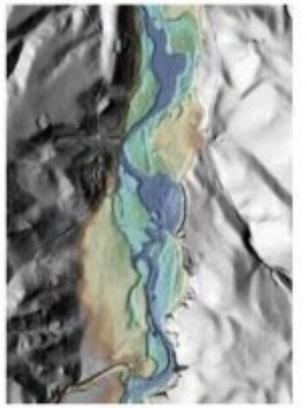
FHZ Zoning Overlay Model Ordinance

Coming Soon!



2020 FHZ Mapping Protocol

Coming Soon!



REM Generation Tool (ArcMap Plug-In)

This tool will assist users in createing a Relative Elevation Model (REM) which can be useful in mapping Fluvial Hazard Zones. The User Guide is Appendix C of the protocol.

Draft FHZ Mapping Protocol Comments

This PDF provides documentation of and a response to the comments received by CWCB between January and March 2020 on the Public Review Draft of the Fluvial Hazard Zone Mapping Protocol.

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CWCB Incentives and Support for Local FHZ Programs and Mapping

The CWCB is committed to assisting communities that wish to map and acknowledge FHZs through the following actions:

- Providing technical and regulatory advisory assistance to communities that wish to map and manage FHZs.
- Allowing FHZ mapping and programs to be considered for competitively awarded grant funding with a 1:1 match requirement via the Colorado Watershed Restoration Grant Program.
- Providing resources to and partnering with organizations and local agencies that are implementing Stream Corridor Easements.

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How will you use a Fluvial Hazard Zone map?

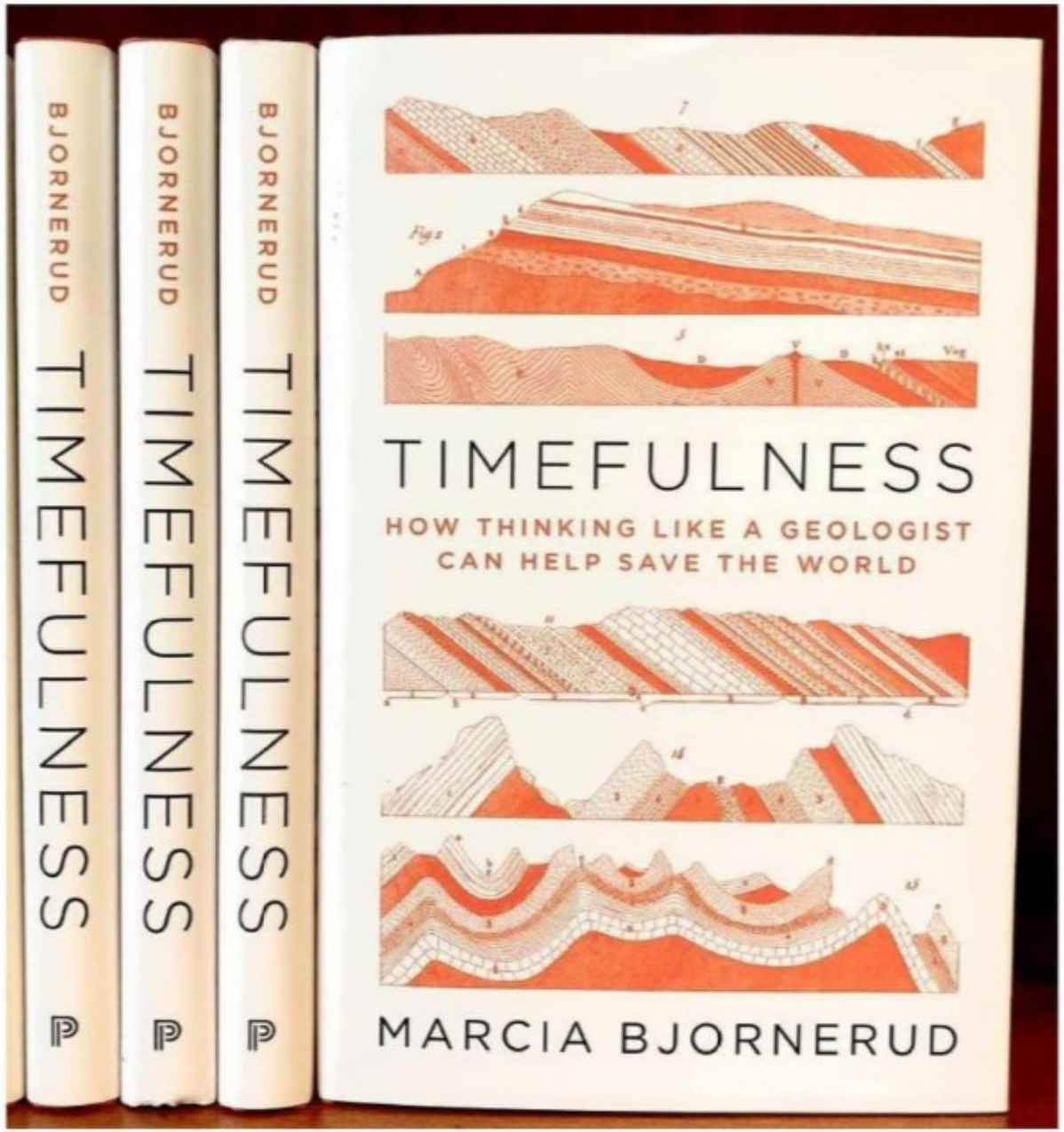
not sure

master planning studies

retrofit corridor - urban

easement acquisition

art in open space



"The lingering nineteenth-century belief that the Earth changes only slowly has lulled us into thinking that it is impassive and eternal, that nothing we do could alter it significantly. That notion has also caused us to view the Earth's intermittent adjustments—the creation of a new volcanic island, a magnitude 9 earthquake—as aberrations, when in fact these events are business as usual for the planet.

We are big enough now to scratch and dent the Earth, scar, and abrade it, but we ourselves will have to live with the damage. **Earth, meanwhile, will continue to make slow repairs, punctuated by sudden renovation projects that will clear away our proudest constructions."**

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TAKE HOMES

- Streams are dynamic, they require space
- Streams are corridors, not lines
- Fluvial Hazard Zone maps provide a helpful way to define the space streams may occupy and influence
- There are many ways to utilize Fluvial Hazard Zone maps to help communities plan for their future and recover better after a flood.

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FLUVIAL HAZARD ZONE

Thank you ☺

- Chris Sturm, chris.sturm@state.co.us
- Michael Blazewicz, michael@roundriverdesign.com
- Katie Jagt, katiejagt@watershedscienceanddesign.com
- Joel Sholtes, jsholtes@coloradomesa.edu

www.ColoradoFHZ.com

Q&A: Enter your questions for our presenters!

Any insights into how best to introduce to a community?

How many communities in CO currently have FHZ maps developed?

What is the approximate cost/level of effort needed to develop an FHZ map?

Do you also incorporate debris flow hazards into FHZ mapping?

What is the incentive for a county commissioner/planning commissioner to adopt the FHZ?

How will FHZ maps be used for SMPs? Are floodplain districts or watershed groups the target?

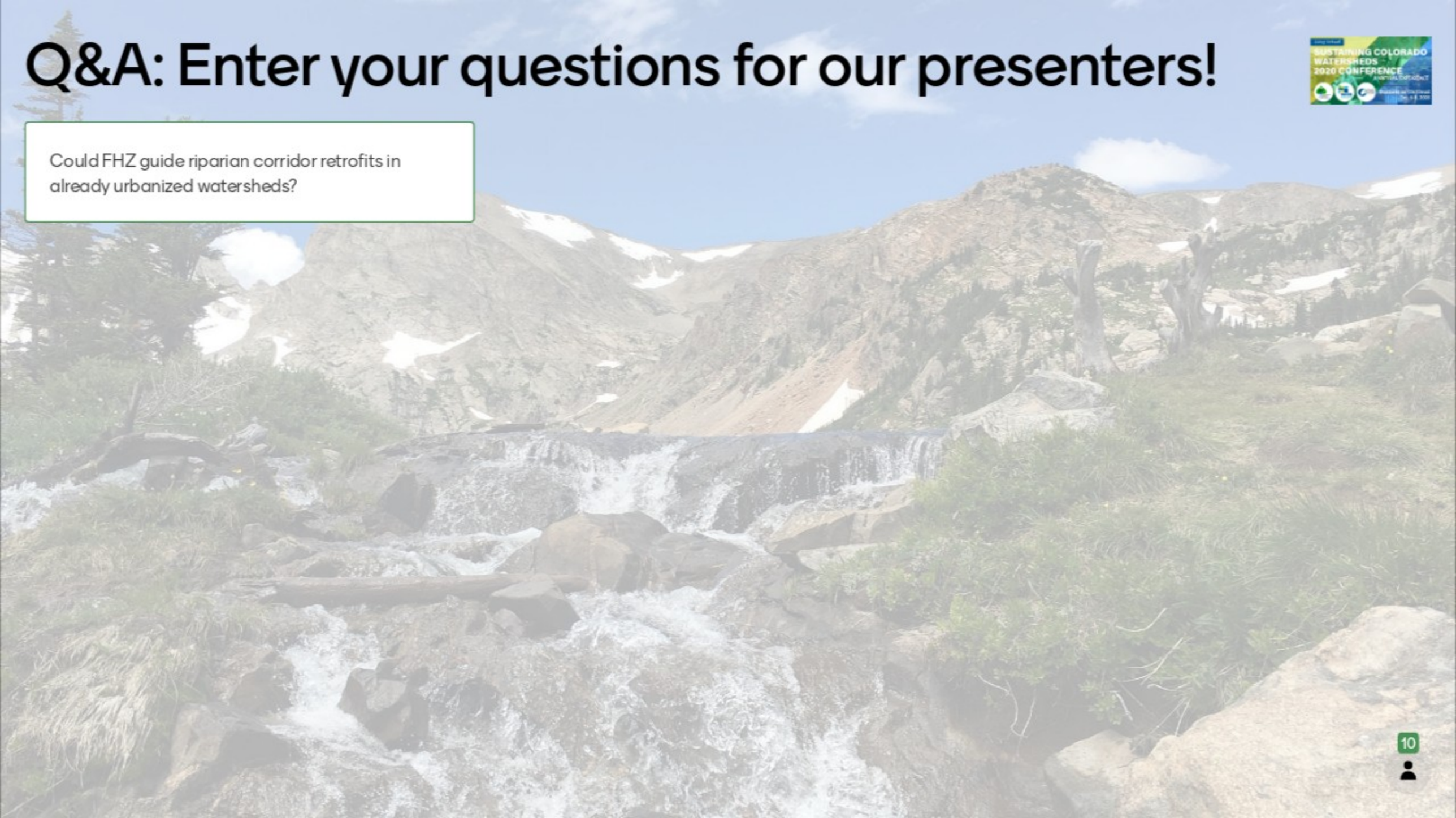
Any rough guidance on cost?

Is the FHZ mapping protocol now available?

I have found this information invaluable in developing areas. Having the "now what" is important when showing a risk in a community.

Q&A: Enter your questions for our presenters!

Could FHZ guide riparian corridor retrofits in already urbanized watersheds?



10

HOW TO SCALE UP WATERSHED RESTORATION - Ecosystem Services of Healthy Watersheds Provides More Partner and Funding Opportunities

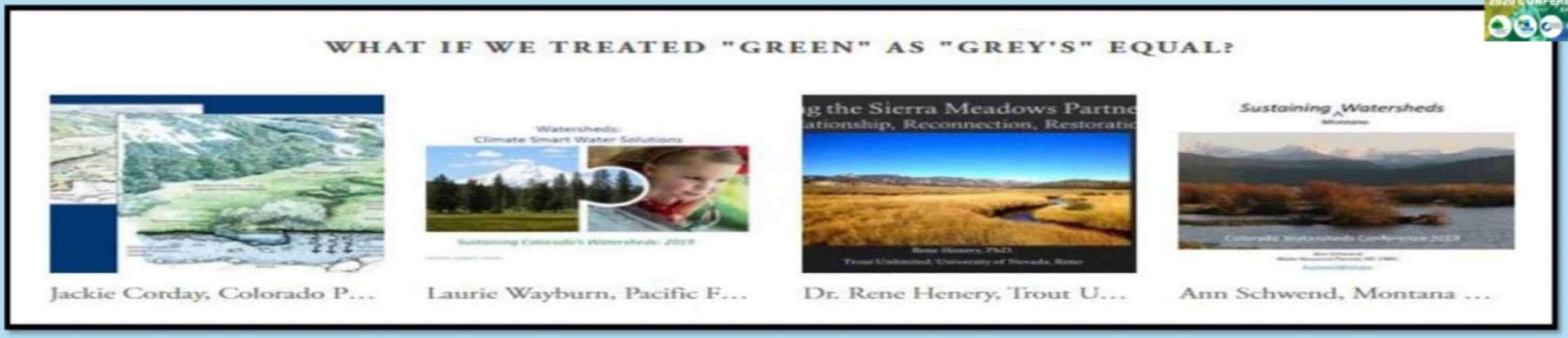
Jackie Corday, Corday Natural Resources Consulting

Fay Hartman, American Rivers

Abby Burk, Audubon Rockies

J. Corday – Verde Lake

2019 SUSTAINING COLORADO'S WATERSHED SESSION



Session highlights:

- Water Plans in California and Montana were updated to add utilizing green/natural infrastructure in their water security toolbox – **protection & restoration of source watershed streams/wetlands/wet meadows**
- Legislation in California and Montana passed to provide funding for source watershed restoration
- Numerous federal, state, local, nonprofit & academic partners came together to make it happen
- Those partners are now working on restoring 1000's of acres of wet meadows in the Sierra Nevada Mountains where snowpack is one of the most important sources of water for millions of Californians

CALIFORNIA BILL AB2480 & MONTANA HB424

2016 California Legislation:

108.5 It is hereby declared to be the established policy of the state that ***source watersheds are recognized and defined as integral components of California's water infrastructure***.

(a) (1) As climate change advances, source watersheds that provide the majority of the state's drinking and irrigated agricultural water are of particular importance to maintaining the reliability, quantity, timing, and quality of California's environmental, drinking, and agricultural water supply.

(2) Recognizing the critical role of source watersheds in enhancing water supply reliability, ***the maintenance and repair of source watersheds is eligible for the same forms of financing as other water collection and treatment infrastructure***.

2017 Montana Legislation:

AN ACT RECOGINIZING SOURCE WATERSHEDS AS A WATER RESOURCE; MCA 85-1-601 is amended to add: Source watersheds are an integral component of Montana's water resources that provide the majority of the state's drinking and irrigated agricultural water are particularly important to maintaining the reliability, quantity, timing, and quality of Montana's environmental, drinking, and agricultural water supply. ***Because source watersheds have a critical role in enhancing water supply reliability, the maintenance and repair of source watersheds are eligible for the renewable resource grant and loan program***.

Why was this legislation so monumental?

- **It was a paradigm shift in thinking beyond the usual grey infrastructure approaches** to water resource management to include natural infrastructure strategies for water security.

- **Acknowledging that healthy watersheds provide ecosystem services at a higher level than degraded watersheds added critical tools** needed as climate change continues to increase the frequency of droughts, fires & flooding.

- **Ecosystem services of healthy streams/wetlands include**:
  - Water supply – aquifer recharge and water quality benefits - sediment retention and water purification
  - Reduced risk of floods (attenuation of flood waters in floodplains & wetlands)
  - Species diversity & habitat resiliency
  - Numerous recreation opportunities

J. Corday –Soap Creek

California drought crisis brought new partners together

Traditional Stream/Wetland Restoration Partners

- Federal and state **land mgt** agencies such as USFS, BLM, CPW
- Federal and state **wildlife** agencies such as USFWS, CPW
- Federal and state **disaster** agencies – FEMA, DOLA
- Federal and state **water mgt** agencies – BOR, ACOE, CWCB
- Federal and state **water quality** agencies – EPA, WQCD
- Federal Ag – NRCS
- Local govt – counties & cities
- Conservation non-profits & foundations – local, state, national
- Watershed groups – local

New Partners, Interests, & Funding

- Water Conservation & Conservancy Districts
- Water providers
- Division of Water Resources
- Agencies, organizations & foundations funding nature-based solutions to **increase/maintain water supply resiliency to climate change impacts** – drought, fires, floods, less snow-pack

J. Corday – Fall Creek

Examples of Natural Infrastructure/Nature-based solutions that achieve multiple stakeholder goals

Method & location	IMPROVED WATER SECURITY	IMPROVED Riverine Habitat	IMPROVED RESILIENCE to intense wildfires	IMPROVED RESILIENCE to flooding
Restoring the ***entire*** **riverscape (floodplains & wetlands)** in rural source watersheds using process-based methods - beavers where appropriate	Yes, increases groundwater recharge and improves water quality – sediment retention & pollutant filtration	Yes, many studies indicate this method provides the greatest ecological lift	Yes, provides filtration of ash/sediment run-off and provides natural fire break & wildlife refuge during fires	Yes, can store/attenuate flood waters to reduce severe flooding
Partial restoration of floodplains in semi-rural to urban areas – e.g. removal or setback of levees, riprap, and/or structures in the floodplain	Possibly – did not come across water security studies as projects are to reduce flood risks & improve habitat	Yes, though not as great as restoring entire riverscapes	Not likely, could filter to some degree, depends on location & other factors	Yes, this is often a main purpose of such projects in addition to improving habitat
Protecting *healthy* floodplains & wetlands from development on private lands (rural to urban areas) with land use regulations, fee title or Conservation Easement purchase, or via land mgt plans on public lands	Yes, critical to identify, protect, and maintain healthy NI	Improves the probability of keeping it healthy	Improves the probability of maintaining resilience	Improves the probability of maintaining resilience

Bringing Stream/wetland partners together in Colorado to upscale headwaters restoration

- Major partners that made it happen in California are here in Colorado, so a workshop was held in Dec. 2019 to discuss collaborating together to increase the pace, scale, and value of process-based headwater restoration.

- Workshop led to the creation of the **Healthy Headwaters Working Group** – state & federal agencies, non-profits, academics, and restoration practitioners.

- Tagline of HHWG – ***What can we do more effectively as a group than working separately?***

J. Corday – South Park

HHWG Highlights 2020

- **First official meeting** in March to agree upon group priorities/goals/action items.

- **Formed two sub-committees** –
  - Science & Projects
  - Policy & Communication

  both of which met over the summer

- **Vision Statement** drafted with over-arching, short, and long-term goals for HHWG and the 2 committees.

- ***HHWG Vision****: Work together to increase the pace, scale, and value of process-based headwaters riverscape restoration throughout Colorado to improve watershed health, critical wildlife habitat, and ecosystem services.*

J. Corday – Middle Fork Cimarron

Highlights of HHWG Overarching Goals

- **Identify priority areas for riverscape process-based restoration (PBR) pilot projects** - serve as a support system for the individual or partnering HHWG members who will carry out such projects.
- **Communication and education plan –** draft to convey the importance of headwaters riverscape restoration.
- **Build capacity and funding opportunities -** Collaborate on opportunities for local, state, and federal funding for restoration and training practitioners in PBR.

Photo Abby Burk, Audubon sponsored riparian restoration on the Dolores River

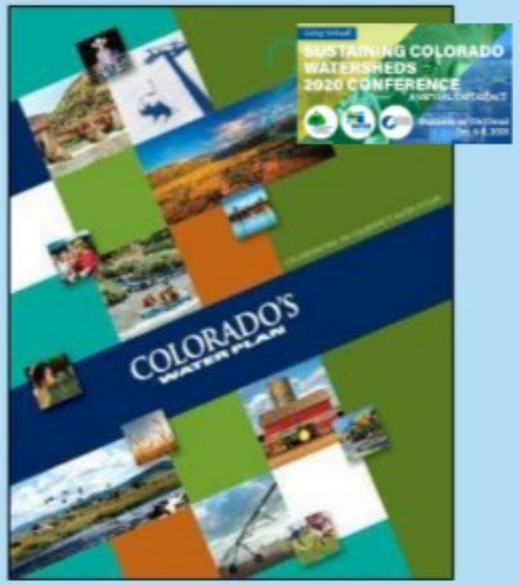
HHWG POLICY COMMITTEE

Goals:

- **Upscale PBR headwater projects through policy** - Develop a roadmap to determine best opportunities with state and regional policies, planning documents, and Colorado's Water Plan to explicitly include headwater restoration as a strategy to improve watershed health, critical wildlife habitat, and ecosystem services.

- **Work to upscale PBR headwater projects through local plans** - work with the Basin Round Tables (BRTs), Basin Implementation Plans (BIPs), and Stream Management Plans (SMPs)/ Watershed Management Plans (WWP) to gain support for incorporating riverscape restoration projects.

- **Develop an education and communication plan** that will assist in achieving HHWG's vision.



Colorado's water values:

- *Productive economy*
- *Vibrant sustainable cities*
- *Viable and productive agriculture*
- ***Strong and healthy environment***
- *Robust recreation and tourism industries*

HHWG SCIENCE COMMITTEE

Goals:

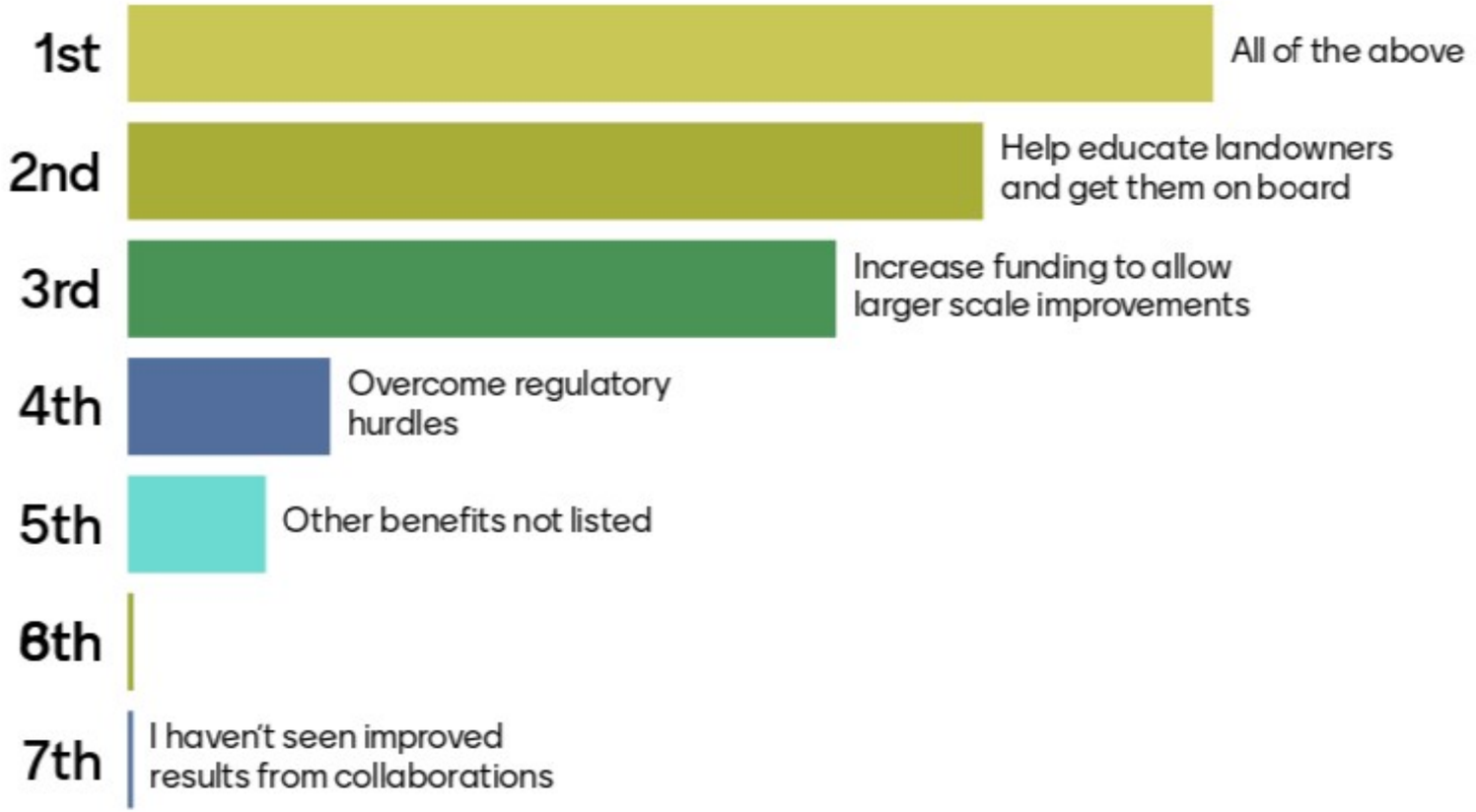
- **Develop tools, mapping, and criteria** to help identify best locations for headwater riverscape PBR projects.

- **Improve the science/monitoring -** develop monitoring protocols for riverscape PBR pilot projects in order to advance the science and understanding of the hydrologic, geomorphic, and ecological outcomes and to provide helpful information to share with water stakeholders.

- **Share and develop best practices for PBR work** – site selection, landowner engagement, project design, O&M, communicating short and long-term expectations.

Photo Abby Burk. Audubon sponsored restoration project Rocky Mountain National Park

What improved results have you seen collaborations for watershed/stream restoration projects achieve?



We've looked at what's happening in California & Colorado . . .

Now we'll look at how **numerous partners are coming together nationally and globally** to scale up using natural infrastructure/nature-based solutions to achieve multiple goals/benefits.

Countries around the world are now utilizing NI strategies to address water security concerns, biodiversity, and improving resiliency to floods, fire and drought

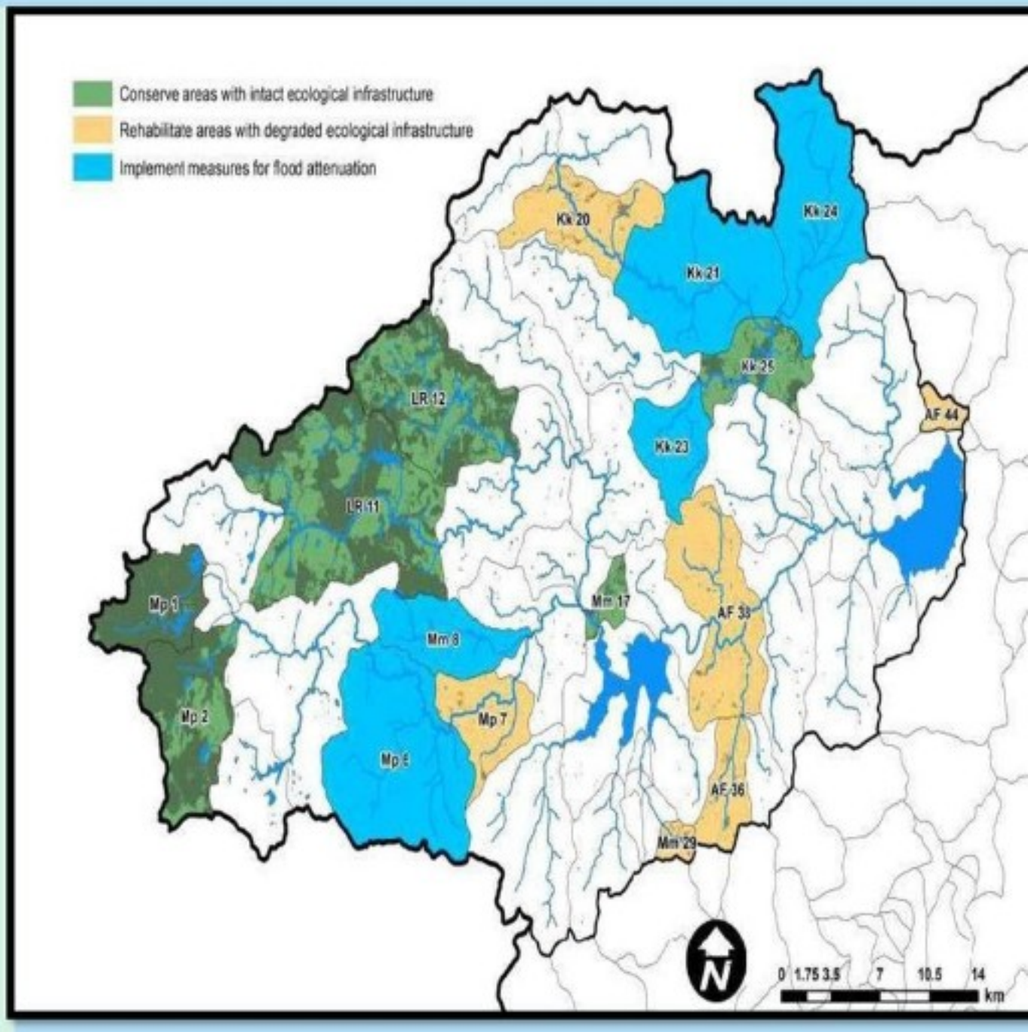
South Africa Case Example

Many stakeholders came together to develop an Action Plan to address two main goals – improve water security and biodiversity:

- **Mapping their source watershed's NI** and **assessing ecosystem condition;**
- **Identify priority NI sites** for intervention and monitoring needs;
- **Identify financial mechanisms** and funding sources;
- **Develop monitoring and evaluation approaches** to assess outcomes of the interventions;
- **Strengthen integrated water resource management** in the source watershed e.g. combining green and grey solutions.

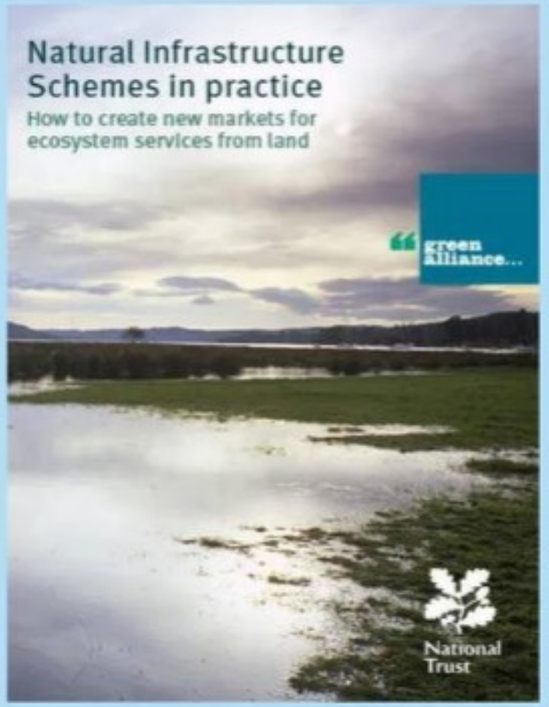
These actions prioritized where to work & what tools to use:

- Protecting the healthy forested areas
- Restoring degraded forests and grasslands
- Flood attenuation measures – e.g. floodplain & wetland restoration



Benefits of Investing in Ecological Infrastructure to Enhance Water Security- Policy Brief

Foundations, organizations, agencies are working to remove barriers to upscaling NI utilization to address flooding, droughts, fires, water security, and habitat loss by supporting policy & science work – fill gaps with case studies and amending policies & regulations to incorporate NI strategies



The Nature Conservancy 2017 Global Report on Protecting Source Watersheds with Nature-based Solutions

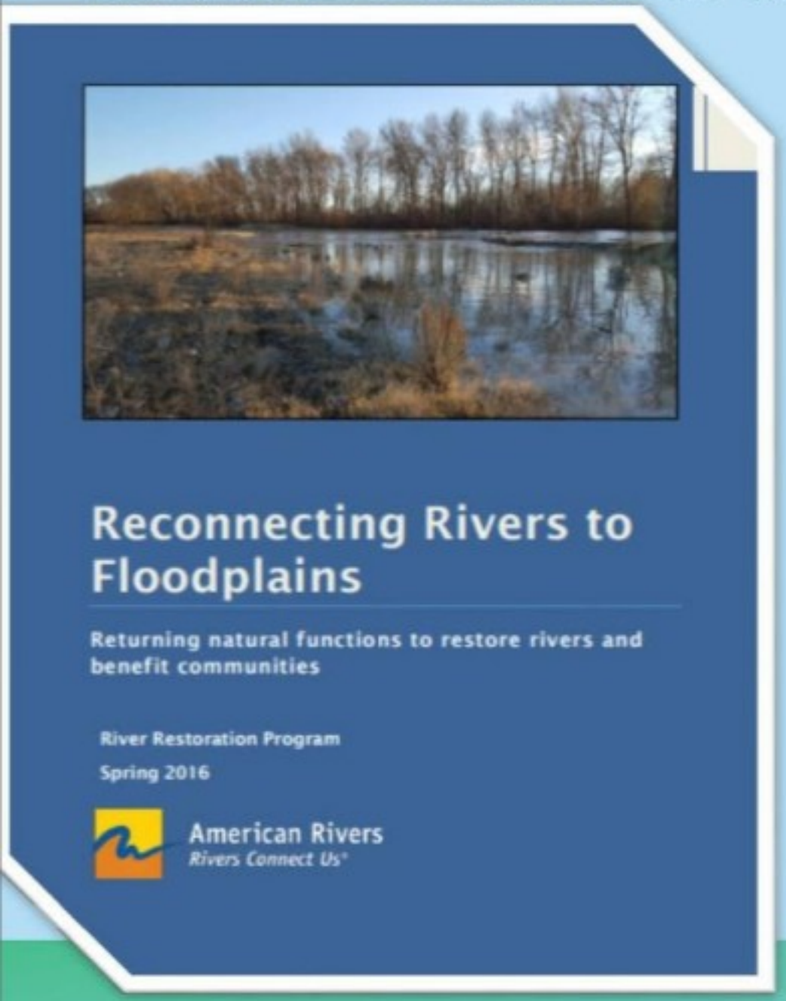
Key Findings:

- **In addition to increased water security**, the report highlights the other ecosystem services provided by healthy watersheds - **mitigating climate change, improving social health, and conserving biodiversity.**
- **Key NI strategies analyzed** include forest fuel reduction to restore health, reforestation of burned or degraded areas, and wetland and riparian restoration and protection.

https://www.nature.org/en-us/what-we-do/our-insights/perspectives/a-natural-solution-to-water-security/

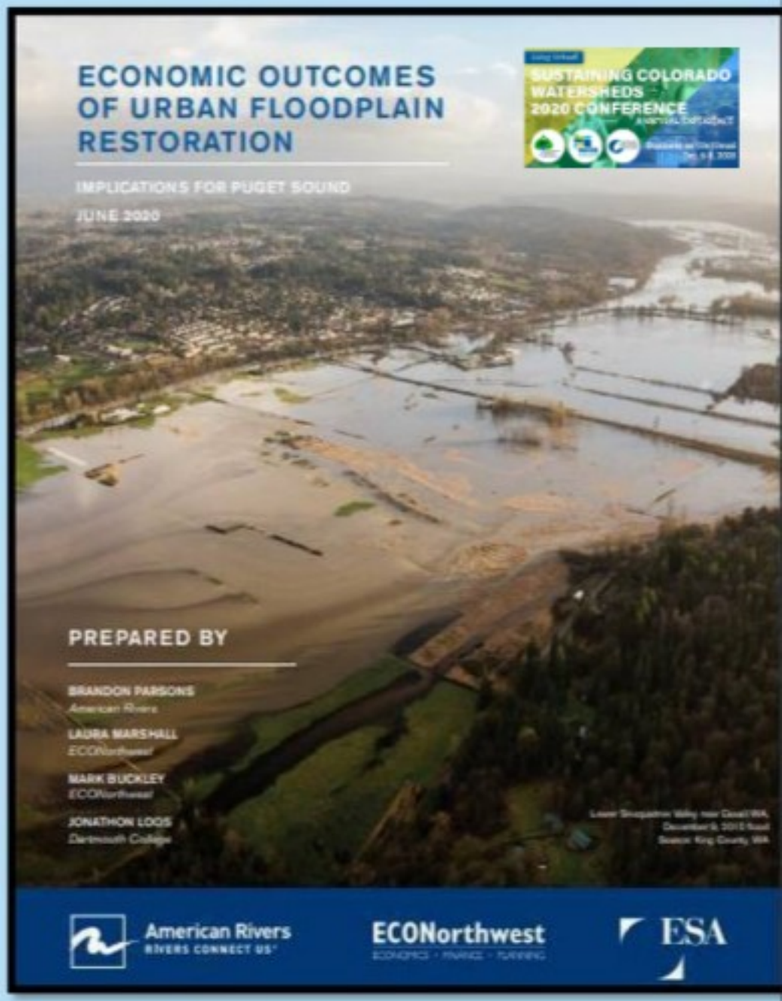
Economic Outcomes of Urban Floodplain Restoration (2020) – Key Findings:

- Compiles examples illustrating the direct financial benefits of urban floodplain restoration on local and state budgets.
- Describes the economic benefits when communities invest in floodplain restoration - lower flood risk and insurance rates, increase in jobs and economic activity, increased property values, and increased tax revenue among other things.



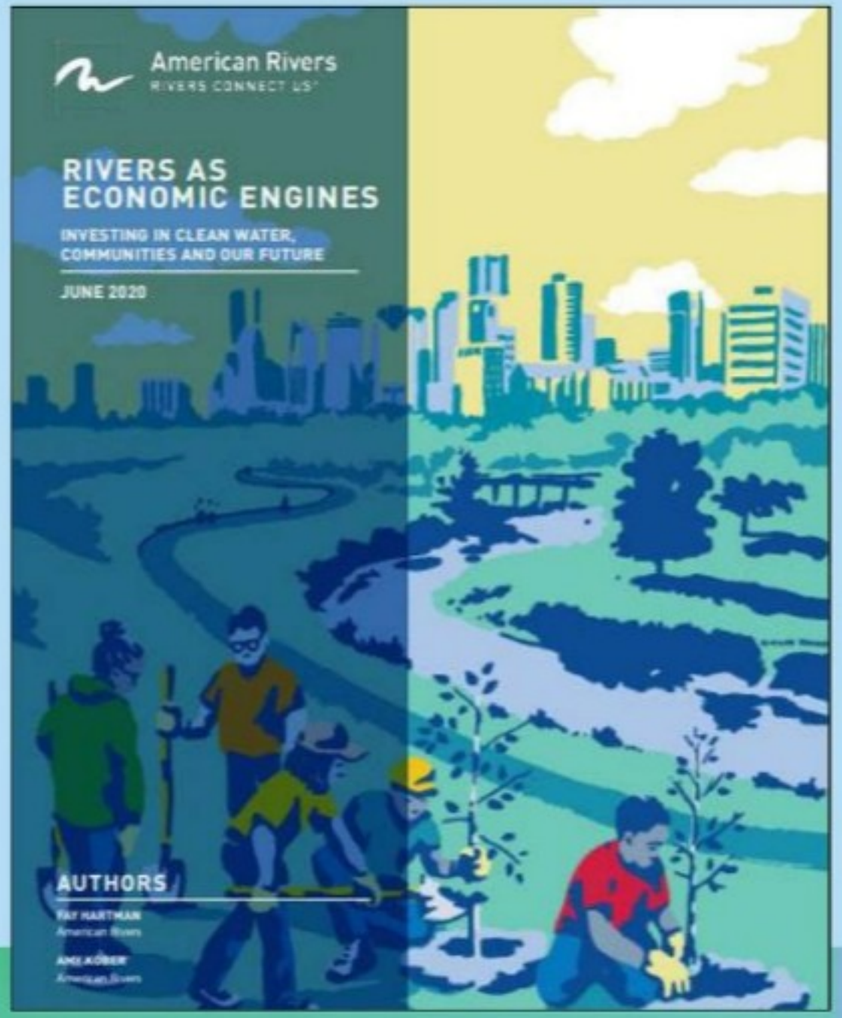
Reconnecting Rivers to Floodplains (2016) – Key Findings:

- Describes the hydrologic and ecological functions that floodplains provide and how those functions are lost when rivers are disconnected from their floodplains.
- Identifies 4 attributes that create and sustain functional floodplains: connectivity, variable flow, spatial scale, and habitat diversity.
- Proposes a framework for considering process-based floodplain restoration and recommends actions to implement.



Rivers as Economic Engines (2020) – Key Findings:

- Describes economic and jobs-based case for investing in equitable and innovative water infrastructure a healthy rivers, including headwater and floodplain restoration.
- Describes how implementing nature-based solutions such as reconnecting streams to their floodplains provide multiple social, environmental, economic, and public safety benefits.



In 2015, Todd BenDor found that ecological restoration, including floodplain reconnection, *directly* employs over 125,000 workers nationally, supports an additional 95,000 workers *indirectly,* and contributes $25 billion to the economy annually, through direct and indirect spending.

Although much progress has been made to educate water leaders about NI strategies in the past 5 years, it remains in the early adopter stage

- Overall investment in NI solutions is a small fraction of the ~$108 billion/year spent nationally on water infrastructure.

- Many more case studies/pilot projects are needed, especially in the arid states, to monitor and document outcomes so that NI approaches can be better understood as compared to traditional grey infrastructure solutions.

- HHWG members are working to upscale such projects, starting with determining which basins will be most suitable for riverscape PBR.

Big Opportunity to upscale headwaters restoration - Coordinate efforts to have State Plans identify & utilize NI strategies for multiple goals listed below

State Climate Action Plans

- Actions to increase resilience to drought, fires, and floods and reduce greenhouse gas
- **Funding: FEMA, EPA, NRCS, State – e.g. DOLA**

State Wildlife Action Plans

- Species & Habitat Management
- Protect/restore biodiversity
- **Funding: USFWS, NFWF, State – e.g. CPW**

State Hazard Mitigation Plans

- Actions to reduce risk and damage from drought, fires, and floods
- **Funding: FEMA, NRCS, State – e.g. CWCB, DOLA**

Benefit from restoring and protecting floodplains & wetlands

CWA 319 Watershed Plans

- Water quality BMPs to reduce nonpoint source pollution
- **Funding: EPA, State – e.g WQCD**

State Wetlands Plans

- Prioritizes actions to protect and restore wetlands
- **Funding: USFWS, EPA, NRCS, State – e.g. CPW**

State Water Resources Plans

- Mgt of water resources for ag, drinking water, industry, recreation, & environment
- **Funding: BOR, EPA, ACOE, NRCS, State – e.g. CWCB**

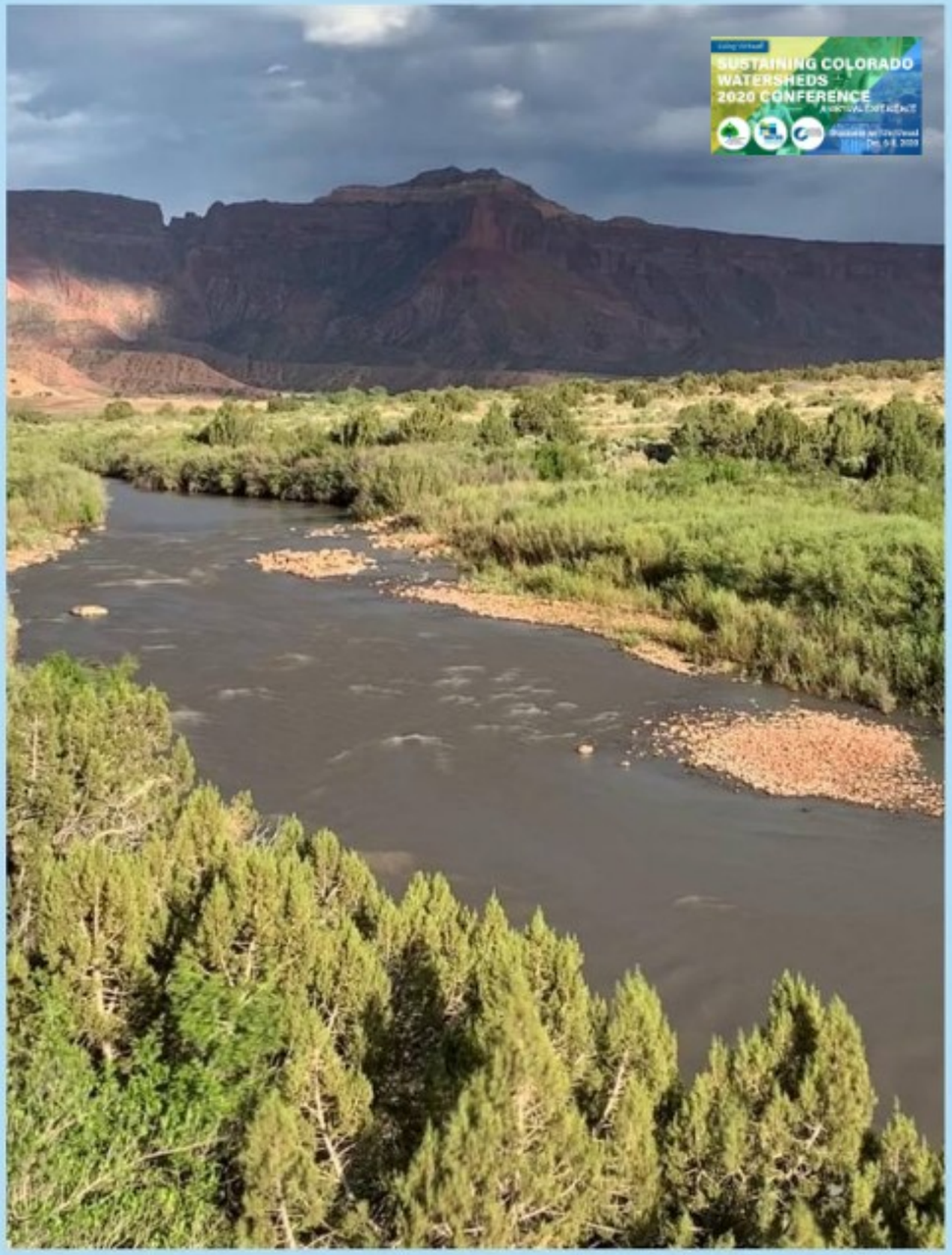
We encourage you to think of opportunities in your communities to utilize the multiple benefits of healthy functioning forests, streams and wetlands in various planning and natural resources stakeholder processes.

Utilize existing opportunities (e.g. SMPs, BIPs, local Natural Hazard Mitigation Plans) in each basin to identify healthy streams & wetlands to protect and maintain;

Identify areas that need to be restored that will help with goals such as reducing flood risk, improving water quality, and riparian habitat;

Work with partners to determine priorities and funding for projects.

J. Corday – Piney Lake



J. Corday - Dolores River

Sinjin Eberle - Crystal River

Q&A: Enter your questions for our presenters!

What is high value development?

Is there a natural federal or state lead to bring these funding streams together?

How does the extreme wildfire season impact HHWG and similar efforts and priorities?

Would downstream states maybe fund headwaters work in Colorado that they rely on (Colorado. River Compact)?

Who do you think would be the best at bringing all of these groups together?

Stakeholder groups well poised to bring different funding streams together

Fly-fishing for youth of color?

STATEWIDE WATER EDUCATION ACTION PLAN (SWEAP)

SCW Conference
10.7.20

"Colorado's first statewide education action plan designed to support the Water Plan's goal of sustainable water by 2050."

SCOTT WILLIAMSON

Education and Outreach Coordinator
Water Education Colorado

SWEAP

TODAY'S OUTLINE

SWEAP

A brief overview of what this presentation will cover…

WHY SWEAP?

We'll discuss the need for SWEAP and how it was created.

HOW DOES SWEAP WORK?

Learn about the SWEAP framework and benefits to local educators and communities.

LOCAL EXAMPLE FROM RFC

Hear an example from the Roaring Fork Conservancy of expanded education in the Roaring Fork Valley

HOW DOES OUR EXAMPLE ALIGN WITH SWEAP?

Find out how the RFC example aligns with SWEAP and ask questions about SWEAP.

WHY SWEAP?

The Colorado Water Plan predicts a water supply shortfall of 500,000 acre-feet by 2050.

Colorado Water Plan
Chapter 9.5: Outreach, Education and Public Engagement

"To expand outreach and education efforts that engage the public to promote well-informed community discourse and decision making regarding balanced water solutions."

Empower Coloradans to take an active role in their communities and make informed decisions about critical water issues.

PEOPLE & PROCESS

How SWEAP was created…

01 FUNDING

- Colorado Water Plan Engagement & Innovation Grant
- ThinkWater by USDA

02 CONSERVATION IMPACT

- Collaborative process
- Situational analysis
- Stakeholder interviews

03 THE COALITION

- PEPO
- NGOs
- Government
- Universities
- Water Educator Network

04 STRATEGIC PLANNING

- Vision/Impact
- Outcomes/Goals
- Strategies
- Actions

SWEAP

HOW DOES SWEAP WORK?

SWEAP Vision

Coordinated, well-funded, and impactful education, outreach, and public engagement achieving measurable objectives in water education by 2025 that contribute to sustainable water by 2050.

SWEAP Impact

By 2025, Coloradans are engaged in well-informed community discourse and decision-making regarding balanced water solutions, and are empowered to take thoughtful action regarding critical water challenges facing the state and their communities.

First-of-its-kind
5-year plan
CO-specific

"*SWEAP strengthens local and regional water education activities through a shared vision that will advance Colorado's Water Plan.*"

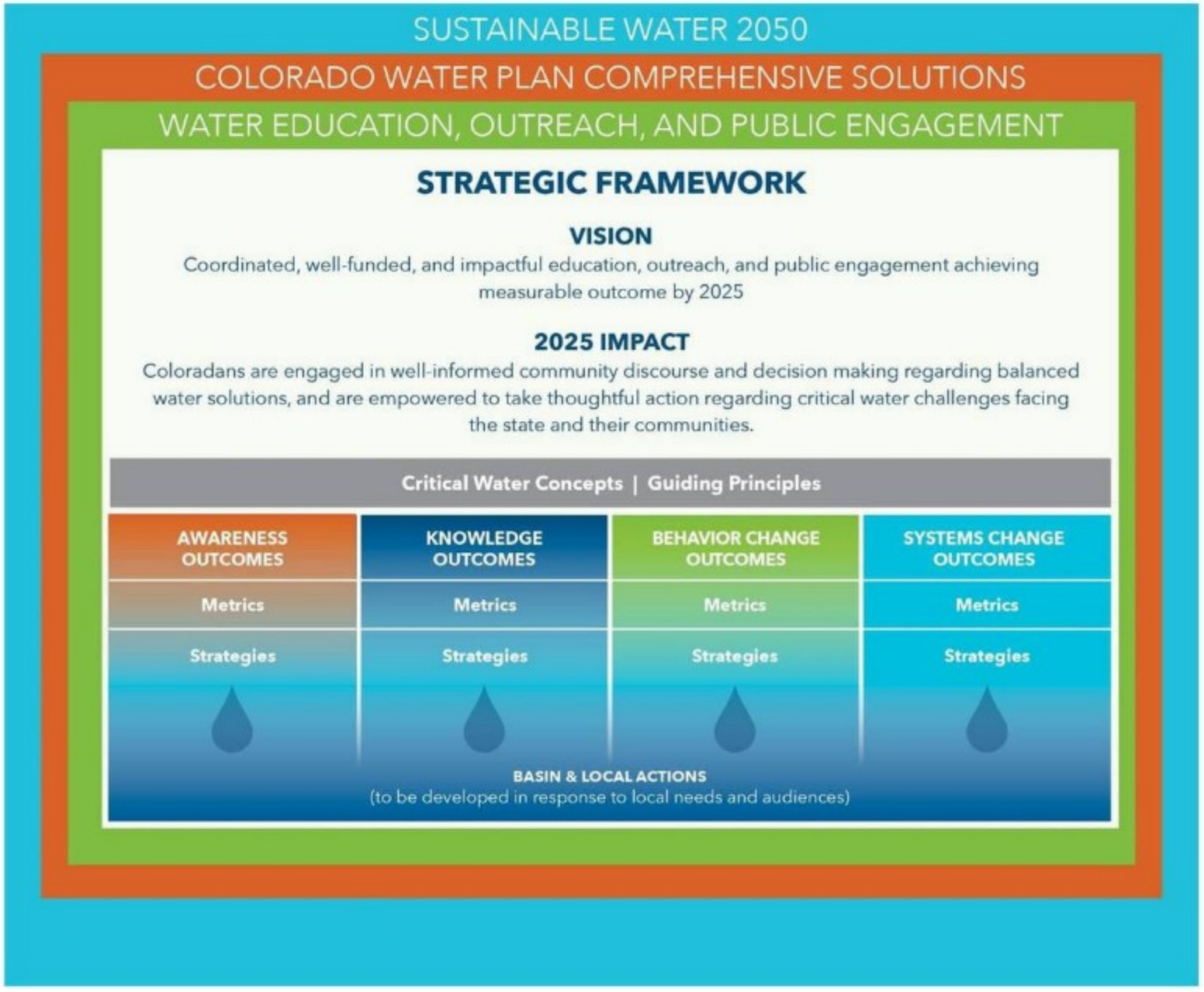
EDUCATION CONTINUUM

Types of SWEAP outcomes and related disciplines…

TYPE OF OUTCOME

AWARENESS	KNOWLEDGE & SKILLS	BEHAVIOR CHANGE	SYSTEMS CHANGE
Awareness is the first step toward engagement.	Knowledge is required for well-informed decisions. Skills are required for effective discourse.	Behavior changes are required for increased engagement.	Systems change is required for balanced solutions and empowered communities.
			
Water educators use public relations strategies to raise awareness. **PUBLIC RELATIONS**	Water educators use education strategies to increase knowledge and teach skills. **EDUCATION**	Water educators use social marketing strategies to encourage behavior changes. **SOCIAL MARKETING**	Water educators use systems thinking strategies to ensure citizens help shape systems change. **SYSTEMS THINKING**

DISCIPLINES AND STRATEGIES



SWEAP FRAMEWORK

The strategic framework is the backbone of SWEAP…

"With a shared vision, guiding principles, and a core set of shared outcomes, individual actions will achieve the greatest possible impact – both locally and statewide."

SWEAP

CRITICAL WATER CONCEPTS

These concepts represent foundational understandings for water education in Colorado.

SUSTAINING COLORADO WATERSHEDS 2020 CONFERENCE

1. The physical and chemical properties of water are **unique** and **consistent**.
2. Water is **essential** for life, our economy, and a key component of healthy ecosystems.
3. Water is a **scarce** resource, limited and variable.
4. Water **cycles naturally** through Colorado's watersheds, often intercepted and manipulated through an **extensive infrastructure system** built by people.
5. The quality and quantity of water, and the timing of its availability, are all directly **impacted by human actions & natural events**.
6. Water is a **public resource** governed by **water law**.

SWEAP

Menti Slide:
Which concept would learners MOST need to understand to help grasp the importance of ecosystem services of healthy watersheds?

1. The physical and chemical properties of water are unique and consistent.
2. Water is essential for life, our economy, and a key component of healthy ecosystems.
3. Water is a scarce resource, limited and variable.
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"

- Balanced and reflective of tradeoffs
- Supportive of the Colorado Water Plan vision
- Objective and fact-based
- Achieved with strong partnerships and collaboration
- Using a watershed approach
- Accessible, engaging, and striving for equity
- Implemented across Colorado
- Adaptive and iterative in response to changing conditions

GUIDING PRINCIPLES

These principles are implicit throughout the plan and should guide the work of educators implementing SWEAP.

SWEAP OUTCOMES

The 10 SWEAP outcomes are organized by discipline.

1 AWARENESS

The proportion of Coloradans in each river basin who can *identify how water supports their quality of life*, as well as the *threats to and potential solutions for a sustainable water supply*, increases.

2 KNOWLEDGE & SKILLS

The proportion of Coloradans in each river basin who can *articulate at least three "Critical Water Concepts"* increases.

The proportion of Coloradans in each river basin who report confidence in having the *knowledge necessary to take an active role in water stewardship* in their community increases.

The proportion of Coloradans in each river basin who report confidence in having the *skills necessary to take an active role in water stewardship* in their community increases.

BEHAVIOR CHANGE

3

Participation in community discourse and decision processes about water at the state, regional and local levels increases.

Voters have access to factual information that addresses potential impacts to sustainable water resources in relevant issue areas.

The proportion of Coloradans in each river basin that are *demonstrating sustainable water behaviors* increases.

SYSTEMS CHANGE

4

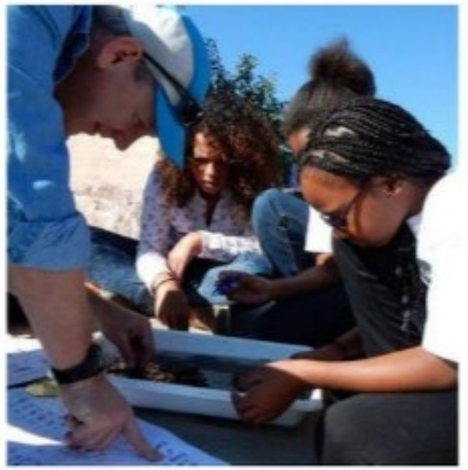
Where relevant, local and state policies and practices are *supportive of advancing statewide water literacy*.

Where relevant, local and state policies, regulations, and practices *demonstrate a consideration of impacts on sustainable water resources*.

Water decision-making bodies are increasingly *representative of the demographic makeup* of the area they serve.

SWEAP OUTCOMES

Continued...



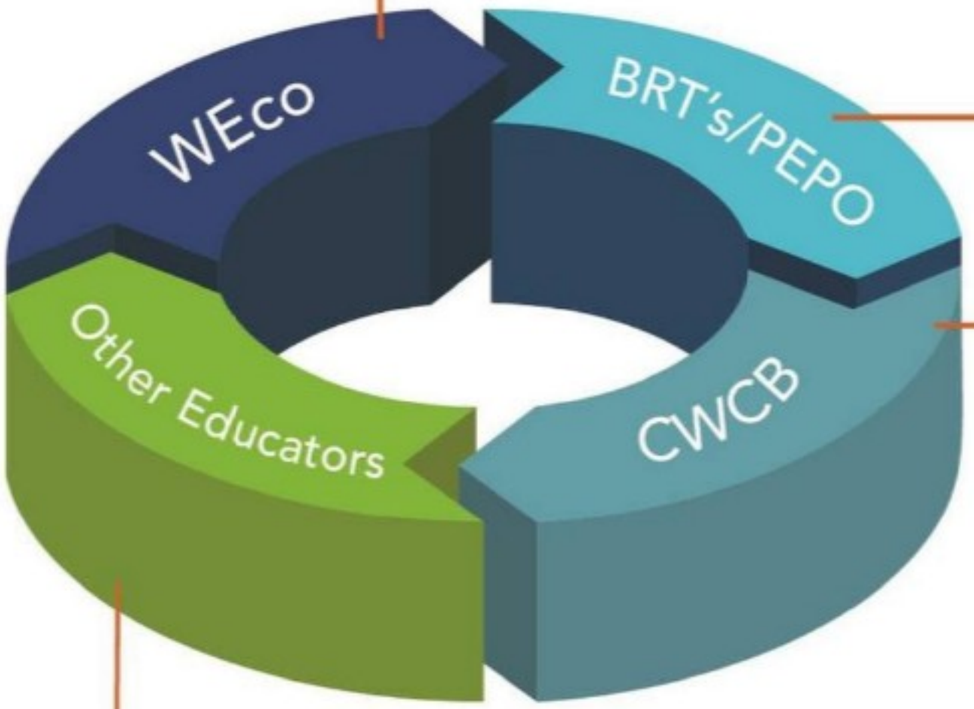
HOW CAN I GET INVOLVED?

- Organizations and individual educators will develop actions to meet the unique needs and interests of their communities, while also contributing to the shared outcomes identified in SWEAP.
- No one is expected to address every outcome or embrace every strategy.

SWEAP bridges water education gaps across the state by supporting and expanding educator reach.

UTILIZING SWEAP

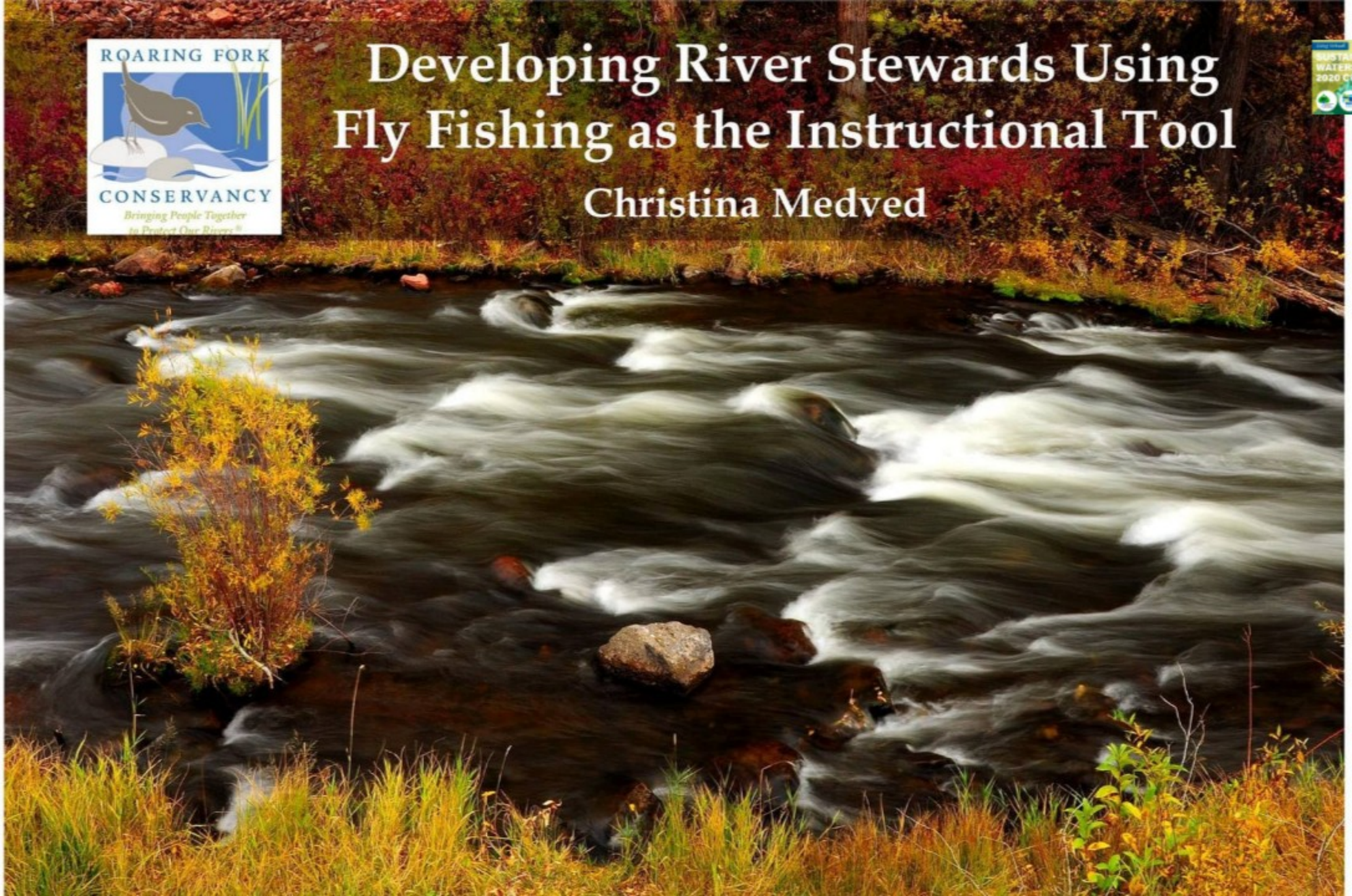
What each group can do to participate…



- Guide a focused statewide strategy; offer resources and support; track progress
- Education Action Plans and BIP updates
- Colorado Water Plan updates
- Identify alignment, contribute to state strategy, amplify efforts, share resources

Developing River Stewards Using Fly Fishing as the Instructional Tool

Christina Medved



NFSP
NATIONAL FISHING IN SCHOOLS PROGRAM

https://www.fishinginschools.org/

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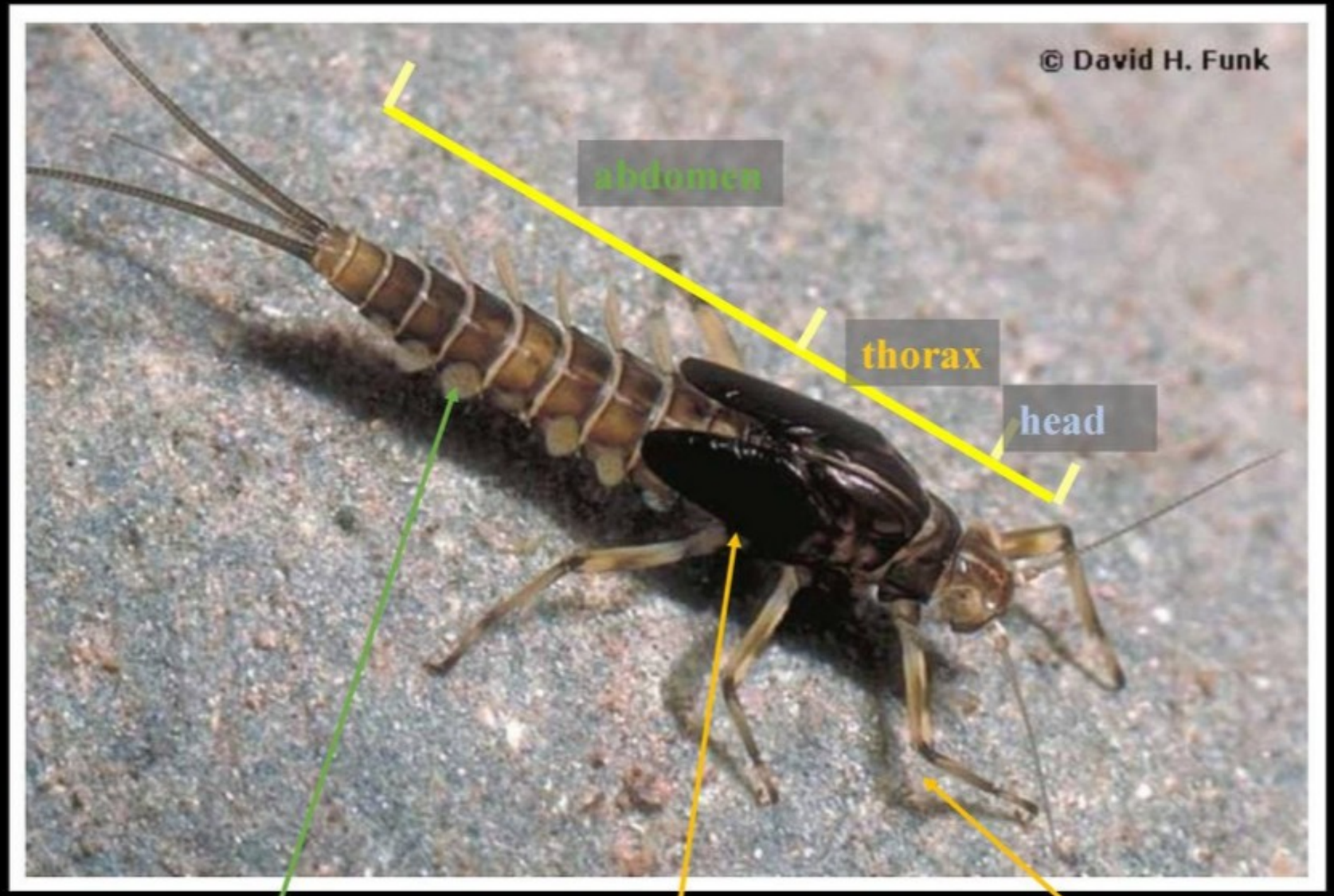
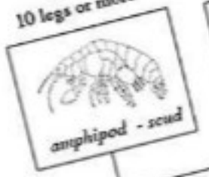
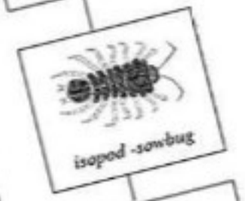
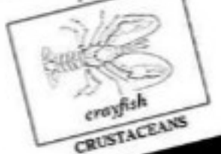
Macroinvertebrate Identification



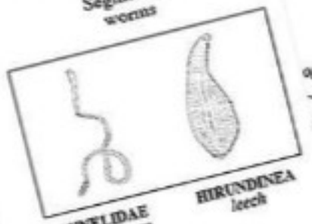
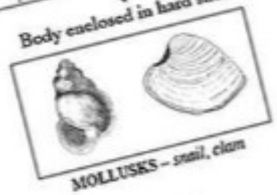
Identification Guide to Freshwater Macroinvertebrates

STROUD Water Research Center

Jointed legs

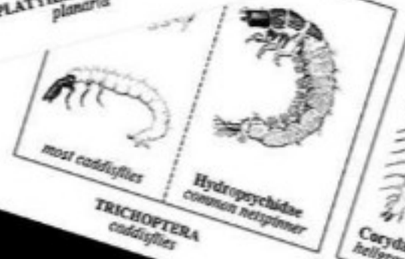
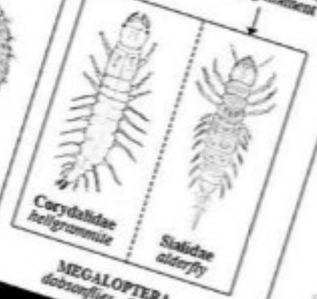
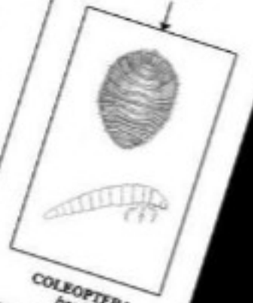
- 10 legs or more
  - 
  - *amphipod - scud*
  - 
  - *isopod -sow bug*
  - 
  - *crayfish*
  - **CRUSTACEANS**
- 8 legs
  - 
  - *mite*
- 6 jointed legs
  - *Go to Page 3*

No jointed legs

- Worm-like (no shell)
  - Head and/or fleshy protrusions
    - *Go to Page 2*
  - Non-segmented flat-worm
    - 
    - **PLATYHELMINTHES** *planaria*
  - Segmented worms
    - 
    - **ANNELIDAE** *aquatic worm*
    - **HIRUDINEA** *leech*
- Body enclosed in hard shell
  - 
  - **MOLLUSKS** – *snail, clam*

Page 3

Six jointed legs

- Observable wings or wing pads
  - At end of body
    - With lateral filaments
      - 
      - **TRICHOPTERA** *caddisflies*
        - *most caddisflies*
        - **Hydropsychidae** *common netspinner*
      - 
      - **MEGALOPTERA** *dobsonflies, fishflies*
        - **Corydalidae** *hellgrammite*
        - **Sialidae** *alderfly*
    - With lateral filaments. Body ends in single, long filament
      - With fleshy prolegs
        - 
        - **LEPIDOPTERA** *aquatic moths*
      - Without prolegs
        - 
        - **COLEOPTERA** *beetles*
  - No observable hooks at end of body
- No portable case
  - Wing pads or wings Present
    - *Go to Page 4*

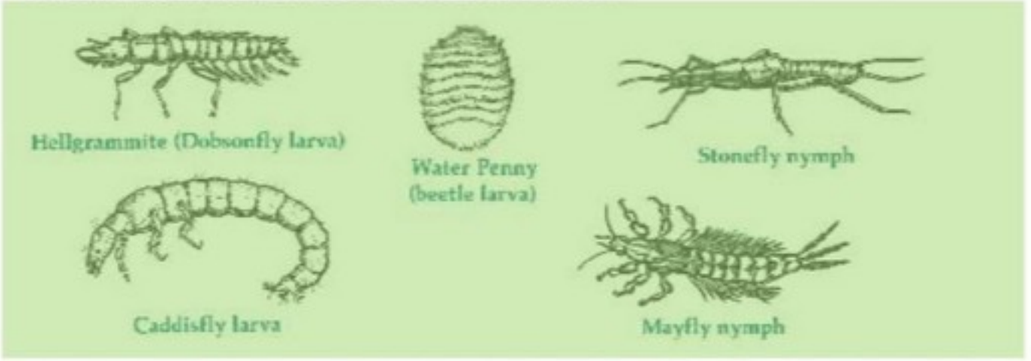
ROARING FORK CONSERVANCY

AQUATIC MACROINVERTEBRATES

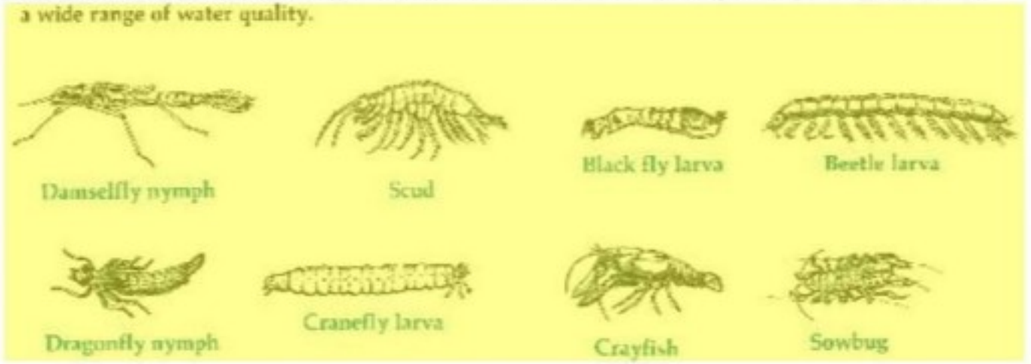
Water Quality Indicators for Streams

Classifying general stream water quality based on the tolerance of aquatic organisms to organic pollution.

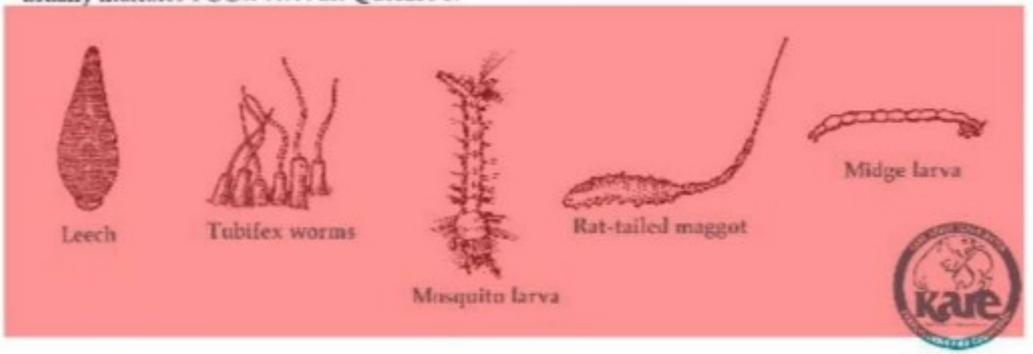
CLASS I ORGANISMS: These organisms are generally pollution-intolerant. Great numbers of these in a stream generally indicates GOOD WATER QUALITY.



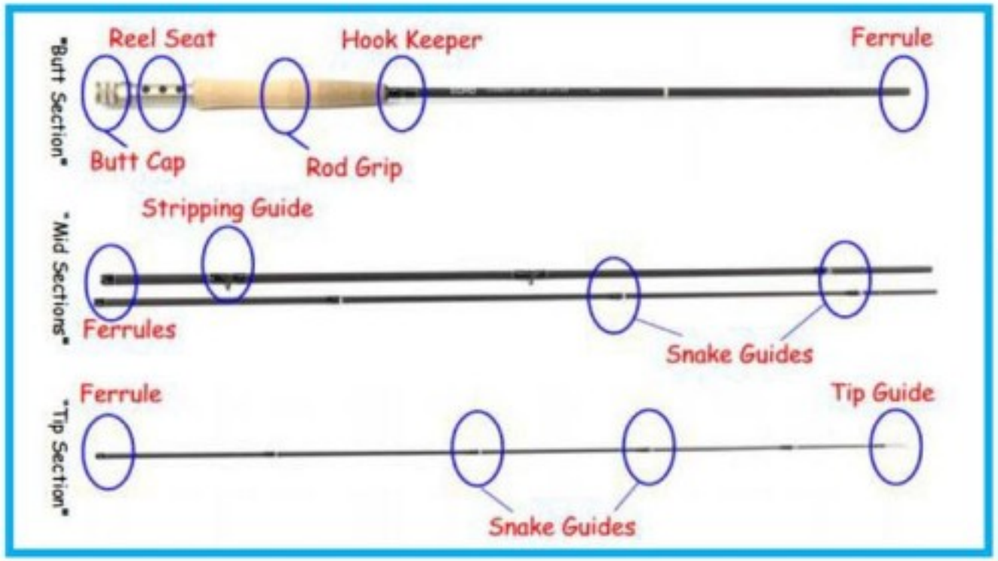
CLASS II ORGANISMS: These organisms are somewhat tolerant of water pollution. They can exist in a wide range of water quality.

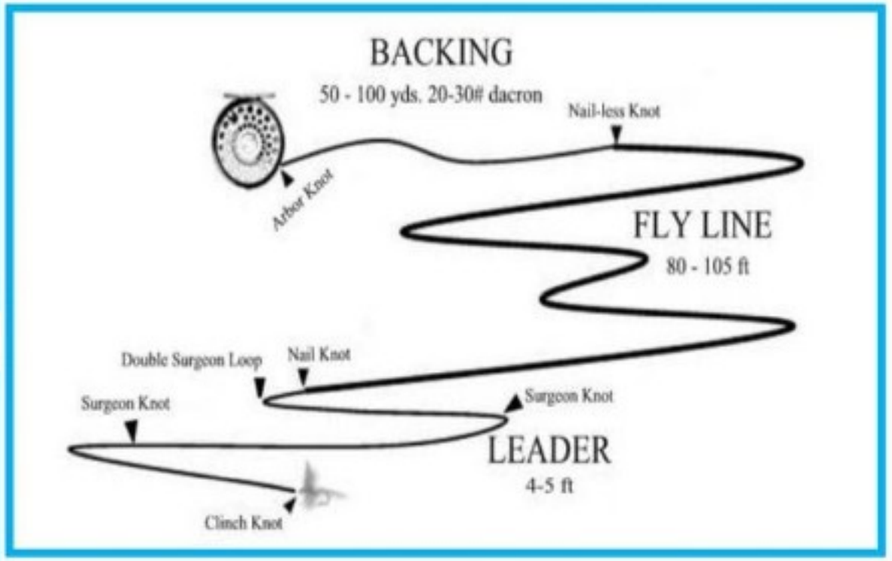


CLASS III ORGANISMS: These organisms are generally tolerant of pollution. Their dominance usually indicates POOR WATER QUALITY.



Equipment: ***Fly Rod, Reel, Line***





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SUSTAINING COLORADO WATERSHEDS 2020 CONFERENCE

ROARING FORK CONSERVANCY

ROARING FORK VALLEY
Fly Fishing Club

COLORADO
PARKS • WILDLIFE

LOCAL FLY SHOPS!

NFSP
NATIONAL FISHING IN SCHOOLS PROGRAM

COLORADO
TROUT
UNLIMITED

ROARING FORK
CONSERVANCY

In one word, what is the main barrier you see to implementing a similar, recreation-based water education program in your watershed?

funding

distractions

2

WHAT ARE THE NEXT STEPS?

SWEAP Timeline

Convening task forces of the Water Educator Network

Nov 2019: *Final CWCB Presentation*

Jan-Mar 2020: *Launch SWEAP*

Apr-Dec 2020: *On-boarding; Baselines*

Jul 2020-Jun '21: *Develop resources; Connect with CWP*

MEASURING SUCCESS

Here's what you can do to help move the needle...

Learn

Visit the SWEAP website: **www.cowateredplan.org**. Download the SWEAP Executive Summary or read the Full Plan.

Support

Please consider submitting an endorsement on behalf of your organization to demonstrate your commitment to SWEAP.

Participate

We invite you to start implementing SWEAP right now! Let us know what you're doing so we can track efforts statewide.

ENDORSEMENTS

Organizations and entities that affirm the value of the SWEAP vision and framework and the importance of achieving its outcomes.

SWEAP

QUESTIONS?

Consider:

How can your organization help advance the SWEAP effort?

What resources would be most helpful to your organization or program for implementing SWEAP?

What gaps in water education do you see in your community?

What challenges do you foresee for your organization to be successful in participating in SWEAP?

SUSTAINING COLORADO WATERSHEDS 2020 CONFERENCE

SWEAP STATEWIDE WATER EDUCATION ACTION PLAN | 2020-2025

Let's work together on this!

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Presentation created by: EVOQUE COMMUNICATIONS

Q&A: Enter your questions for our presenters!

Christina - do you work directly with local schools or after school programs to enroll youth in your programs?

What has been the Colorado Dept. of Education response to SWEAP?

How are you including the new generations and engage diverse communities' education in watersheds training?

What is timeframe for next steps - how quickly do you expect increase in ability of citizens in each basin to learn and apply the key concepts?

Is sweap designed for more school aged kids, general Colorado adults, other community members who should be involved in water issues?

How are you engaging minority communities?

Is there a role for higher education institutions in the SWEAP plan?

It seems like water education for students and decision makers is needed and "easier". Is it harder to reach everyone in between (the general public)? The public has many things asking for their attention.

THANK YOU!

Our (Un)Usual Happy Hour begins right after this at 3:45pm!

To get there….

**Close out of this Webinar session, return to EXPO,
and navigate to the (Un)Usual Happy Hour on Oct. 7**

Then open that session and click “Join” to enter the ZOOM for the happy hour