



# The Value of Lived Experience in Environmental Flow Assessments

## Overview of the Grand Valley Pilot Project

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# OUTLINE

- Background
  - RCI
  - Environmental flows in stream management planning (refer to River Network's memo)
- Lived Experience Concept
  - What is it and why use it
  - Diana's example table
- Stakeholder Engagement
- Technical Flow Analysis
- Outcomes
  - relationships between flows and attributes of value
- Key Takeaways
  - Lessons learned



# BACKGROUND

## Grand Valley River Corridor Initiative

A community-driven initiative focused on supporting and maintaining a healthy river corridor and the associated needs, uses, and values for generations to come.

*Photo by Devon Balet*



# BACKGROUND



## Flow Recommendations in SMPs – Opportunity Analysis

January 2023

### 1. Introduction

Since 2017, River Network has supported programmatic development and peer-learning to increase the number and effectiveness of stream management and integrated water management plans (SMPs) in Colorado. River Network's 2021 report: [Stream Management Plans in Colorado: Progress at Five Years](#), includes a series of recommendations for boosting the momentum of SMP development in Colorado. One of the recommendations, deemed a high priority by River Network, focused on the need to better understand the barriers and opportunities for advancing environmental and recreational (E&R) flow recommendations resulting from individual SMP efforts.

River Network and Colorado Water Conservation Board (CWCB) co-hosted a series of workshops in 2022 to gain insights on the barriers and opportunities for utilization and/or development of E&R flow recommendations within the context of SMP planning processes. Workshop participants (list provided in acknowledgements section) included NGOs and agency representatives with interest or expertise in setting and implementing E&R flow recommendations. Workshop participants agreed that an opportunity exists to increase the number of new E&R flow recommendations that are produced within individual SMP planning efforts. This document reflects workshop outputs and frames the perceived barriers to and actions required for advancement of flow recommendations by groups developing SMPs across Colorado.

## Opportunities

1. Better Align Flow Recommendation Process with SMPs
2. Enhance the Level and Type of Flow Information Produced
3. Bolster Collaborative Process Design and Co-Learning Practices
4. Honor the Value of Lived Experience in Flow Assessments
5. Clarify Guidance (and Potentially Incentives) to Establish Flow Recommendations

# BACKGROUND

“While much of the flow recommendation process is **science-based**, there is an opportunity to use the flow recommendation process to **better involve stakeholders and their lived experience**, resulting in a **more accurate flow needs assessment** that incorporates both science and stakeholder input.”

“One tool or activity to consider is an **interactive stakeholder analysis** that results in a **description of relationships between flows and attributes of interest**.”

# STAKEHOLDERS

## **Environment, Recreation & Neighborhoods**

- Endangered Fish Recovery Program/  
FWS
- CO Parks & Wildlife
- Grand Valley Audubon
- RiversEdge West
- CO Canyons Association
- Municipal Parks
- Riverside Neighborhood rep

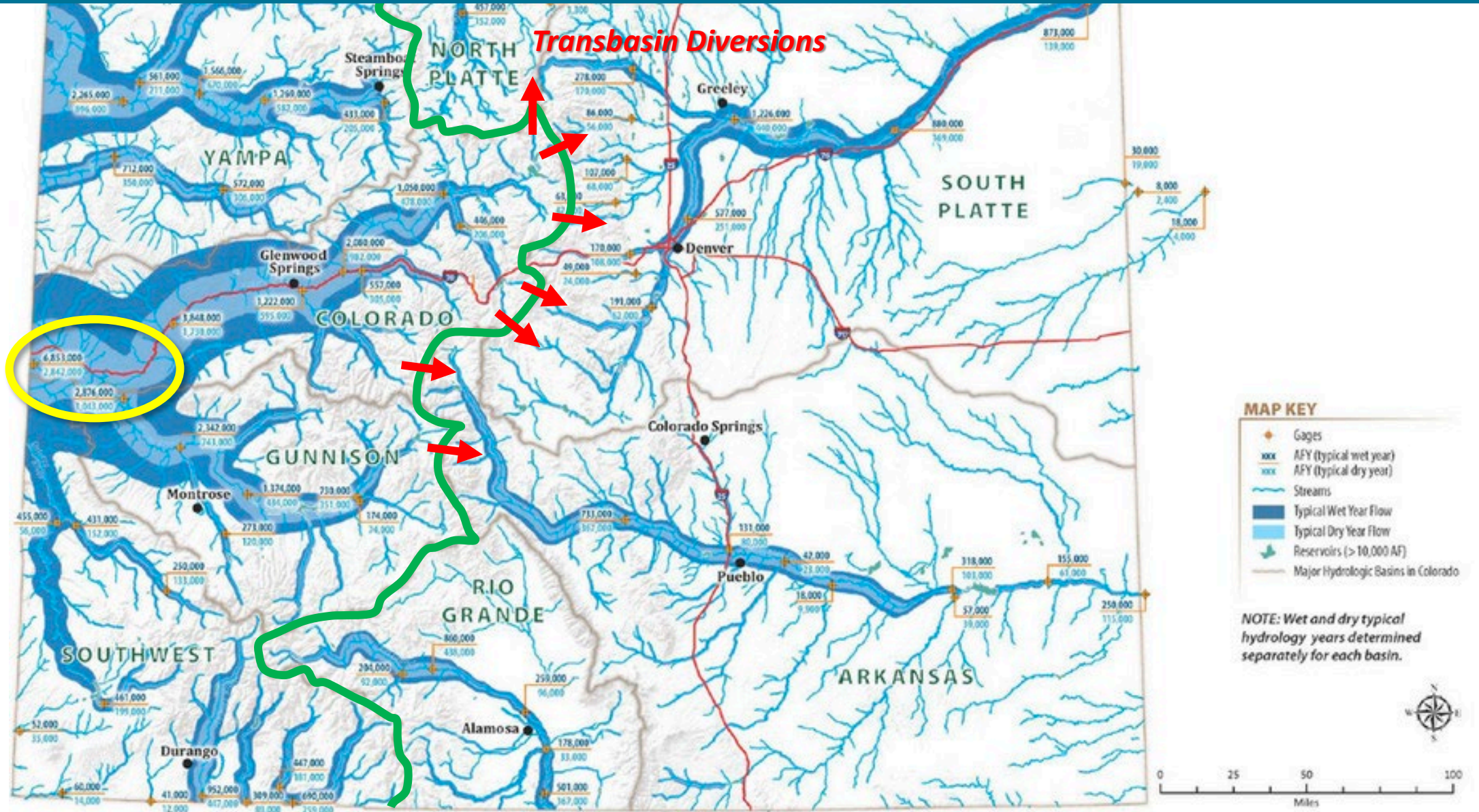
## **Agriculture, Infrastructure & Development**

- Orchard Mesa Irrigation District
- Palisade Irrigation District
- Grand Valley Water Users  
Association
- Mesa Conservation District
- Ute Water
- Clifton Water
- Development Company



# FLOW ANALYSIS

## Colorado River Basins





# Rivers in the Grand Vall





Colorado River

Plateau Creek

Colorado River

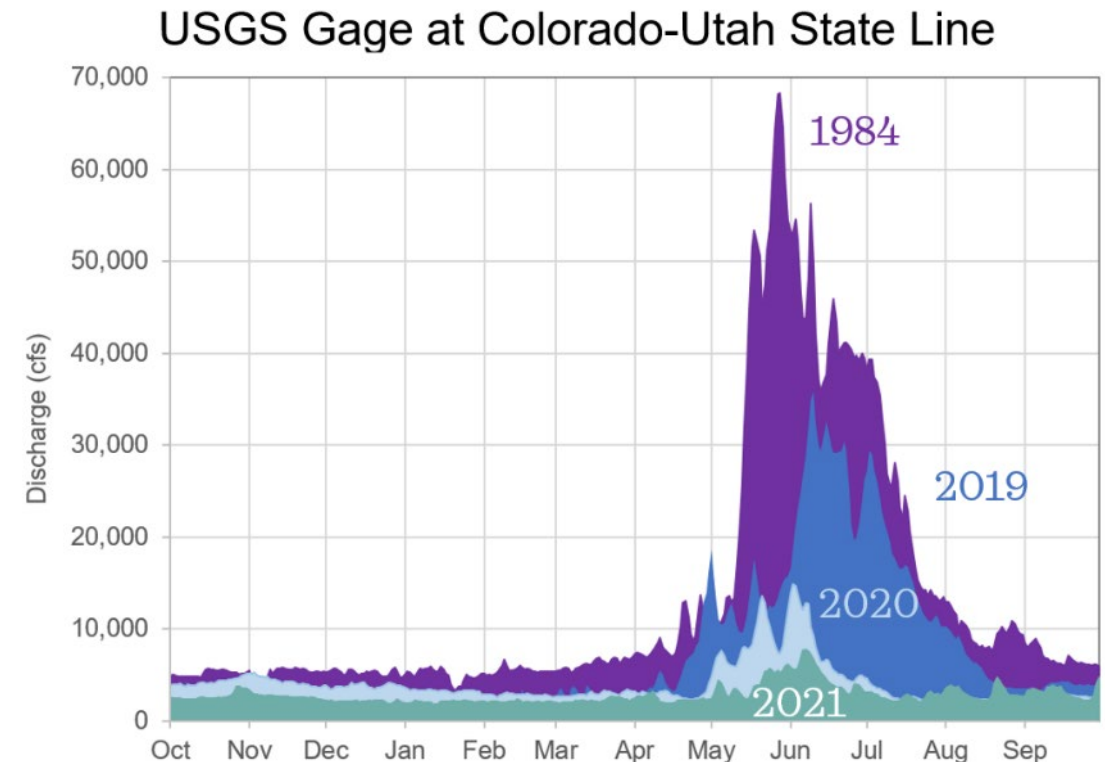
Gunnison River

-  Stream Gage
-  Major Diversion

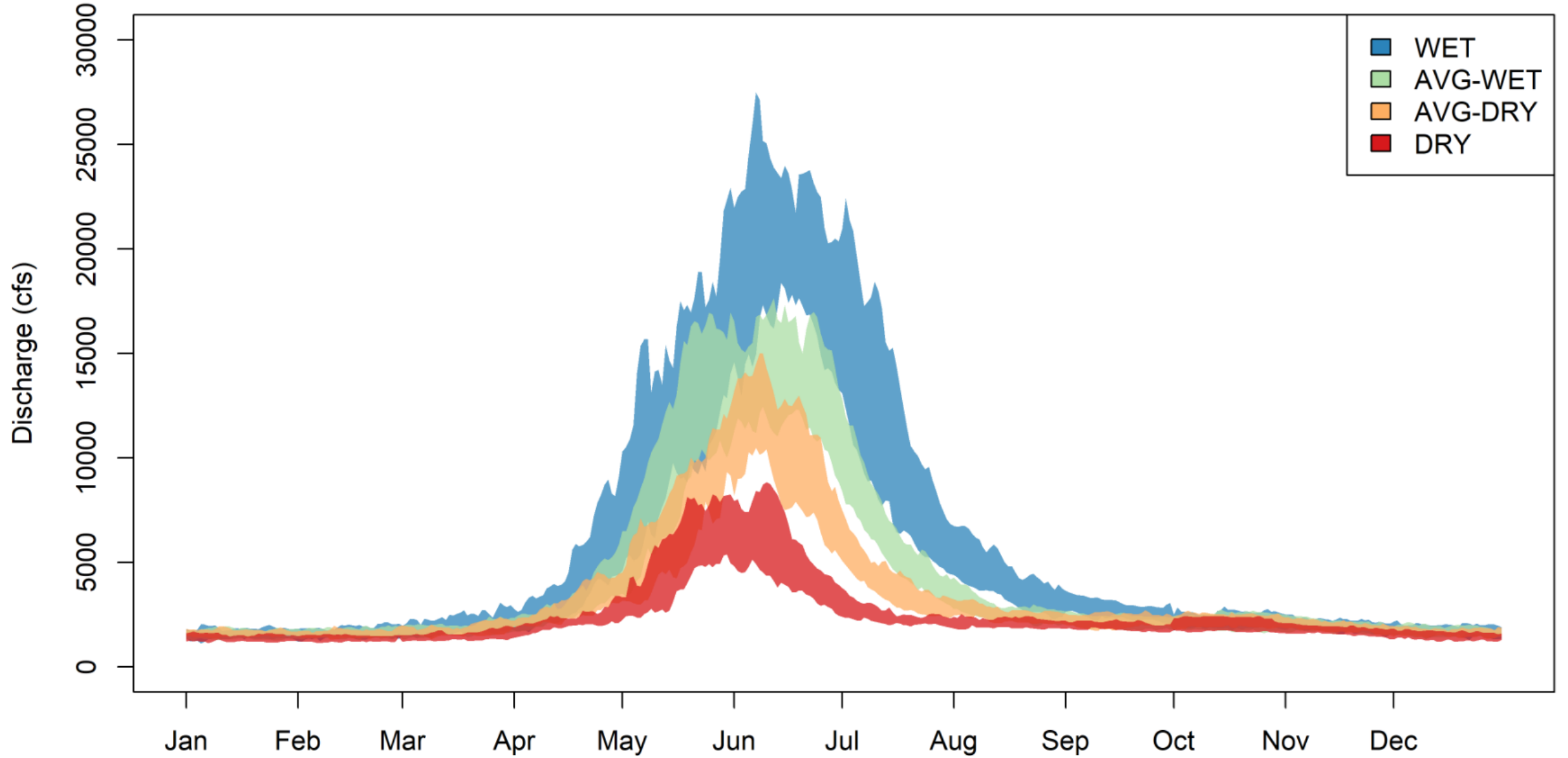


# Flow Analysis: Water Year Types

- April to July Runoff Volume
- Upper Colorado River Recovery Program
- Colorado at Cameo Gage
  - Wet (> 80 percentile of all years)
  - Avg. Wet (50-80 percentile)
  - Avg. Dry (25-50 percentile)
  - Dry (< 25 percentile)



# Hydrograph by Flow Year Class (Cameo Gage)





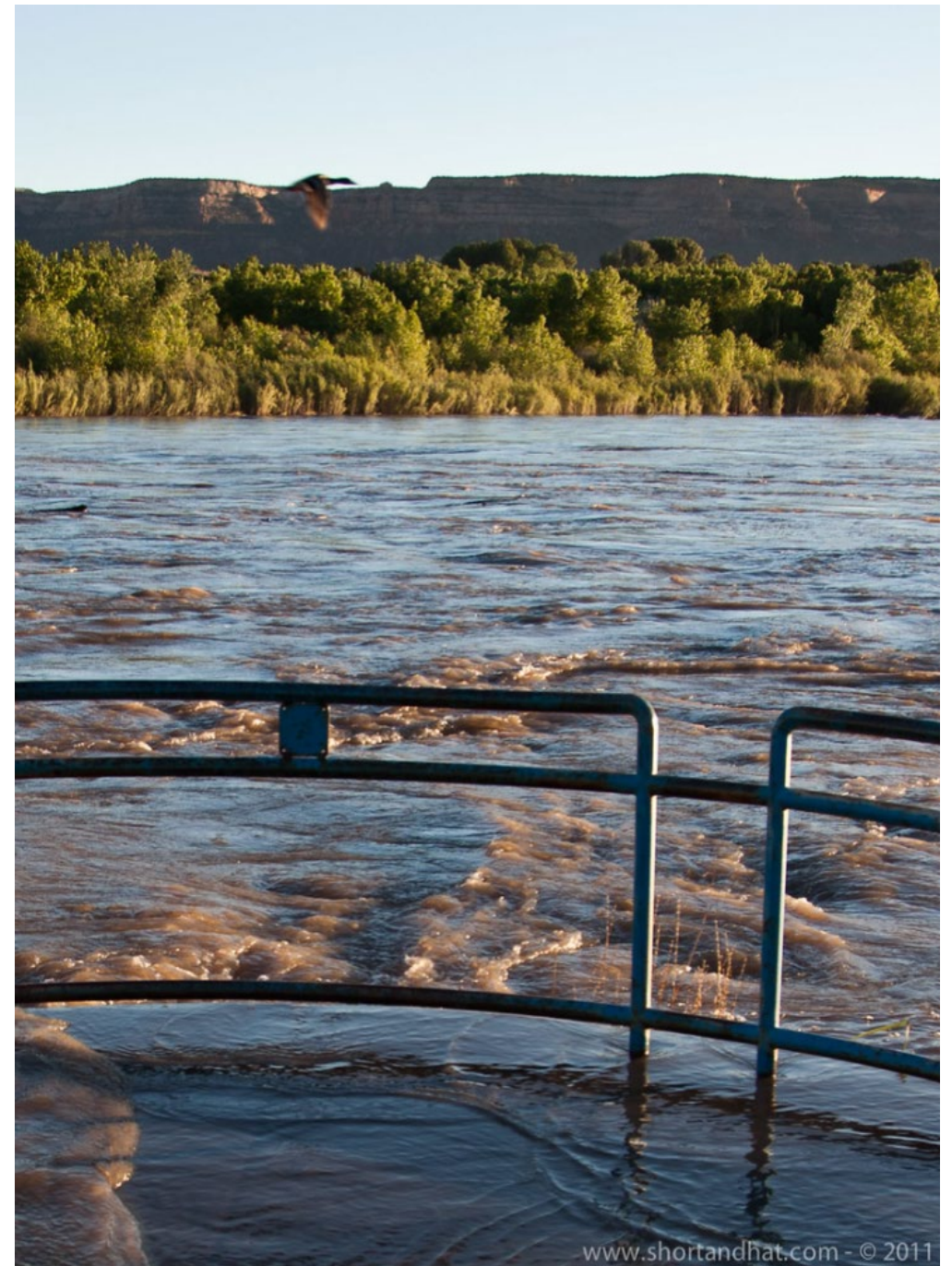
# Average Years



Normal = no problems



# Wet Years





# Dry Years






# FLOW EXPERIENCE DESCRIPTIONS

Hypothetical Example for Describing Conditions at Different Flow Levels -  
 All Flow Ranges and Observed Conditions are for Illustration Only and Do Not Represent Real Data or Information

Flow Range	Observed Conditions at Different Flow Levels					
	Infrastructure/Safety	Agricultural water users	Recreational users	Environment	Economic	Other notes
7,000+ cfs	500 yr flood event; potential for loss of life and infrastructure damage	Likely infrastructure damage to diversions; potential for erosion and flooding of fields	Unsafe for all recreational users	Can destroy existing riparian vegetation but create conditions for new riparian vegetation establishment	Could estimate economic impacts from other categories	Highest flood on record was XX cfs in 19XX
5,000 cfs - 7,000 cfs	100 yr flood event; some potential for loss of life and infrastructure damage if there is extensive floodplain modification	Likely infrastructure damage to diversions; potential for erosion and flooding of fields	Safe for experier kayakers and professional raft unsafe for all oth recreational use	Can damage or destroy existing riparian vegetation but create conditions for new riparian vegetation establishment	acts from es	Note frequency of 100-yr flood in the past 20 years
2,000 cfs - 5,000 cfs		Free river conditions - all senior and junior water rights holders can use full allotments	Free wading		efits from d se	Compare historic flow range frequency vs. recent hydrology (2000 - 2020) or modeled future hydrology
500 cfs - 1000 cfs		River goes on call; junior water users are curtailed	Safe for kayakers, SUPping, and tubing; excellent wade fishing conditions	Generally adequate flows to maintain healthy temperatures for cold-water fish	Could estimate economic impacts from curtailments	Fish health in this flow range depends on water temperature and dissolved oxygen
100 cfs - 300 cfs	Wastewater Treatment Plant Discharges may have trouble meeting temperature standards, municipal systems may require water use restrictions	More water users curtailed	Too shallow for safe kayaking/SUPping/tubing in certain reaches; may have water quality concerns; voluntary recreational closures possible	Fish seek out deeper pools to avoid higher temperatures, can become vulnerable to predation by nonnative species and increased mortality from angling pressure	Could estimate economic impacts from curtailments and recreational closures	Compare historic flow range frequency vs. recent hydrology (2000 - 2020) or modeled future hydrology



# FLOW EXPERIENCE DESCRIPTIONS

Flow Range	Environment	Recreation	Neighborhood	Agriculture	Infrastructure	Development	Key flow levels	Timing	Other comments
<b>Low</b>									
General									
Cameo									
Palisade									
Whitewater									
<b>Medium</b>									
General									
Cameo									
Palisade									
Whitewater									
<b>High</b>									
General									
Cameo									
Palisade									
Whitewater									



# FLOW EXPERIENCE DESCRIPTIONS

## **Wet – Recreation & Environment**

- Riverbend Park washed out at the West End in 2011.
- Armoring banks in response to floods leads to later impacts.
- Interactions with Russian Olive increase at high flows between Palisade and Clifton.
- For fish & wildlife, it's best to have high water at least every 10 years.



# FLOW EXPERIENCE DESCRIPTIONS

## Wet – Agriculture & Infrastructure

- In 2011, had to take a canoe to access the Clifton Water office.
- At OMID, water gets in the tail race and affects pumping.
- There's more sediment to manage; debris levels depend on what the previous year was like.

*"Over 20,000 cfs at Cameo for sure there will be trouble."*

# FLOW EXPERIENCE DESCRIPTIONS

## Dry – Recreation & Environment

- *"River use disappears; some trail use still occurs, but in 2002 also no camping, no fires, no lake use - from a recreational perspective - visitation/revenues go flat."*
- *"People misjudge float times... People aren't prepared to be out after dark."*
- *"Access becomes harder (pushing through mud)"*
- *"Below 1,000 or 800 cfs, habitat conditions deteriorate a lot. It concentrates fish in smaller areas, and they [native fish] become more vulnerable to invasive fish."*
- *"Revegetation is difficult – how are the plants going to access water?"*



# FLOW EXPERIENCE DESCRIPTIONS

## **Dry – Agriculture & Infrastructure**

- Algae becomes a problem – but sediment usually isn't.
- In 2002 and 2012, OMID had to alternate running canals.
- In 2020, Ute Water had to pump water from the river.
- Three dry years in a row would be really bad.

# LESSONS LEARNED

- The impact of one year at a particular flow level is less important than the sequence of wet – dry years.

*"The system is used to variability. Wet & dry years individually are not a problem. Stacking wet or dry years together may be a problem."*

- The status of upstream storage is also important.
- Collaborative management makes a difference.

*"Last year was perfect because of a combination of weather and management."*

- Discussion doesn't stay within the parameters of the flow preference matrix – and that's good.

# KEY TAKEAWAY

Primary value is less in identifying key flow thresholds than in finding out what those thresholds mean to people's lives and experience of the river.







Thank you!

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# ABOUT RIVER NETWORK

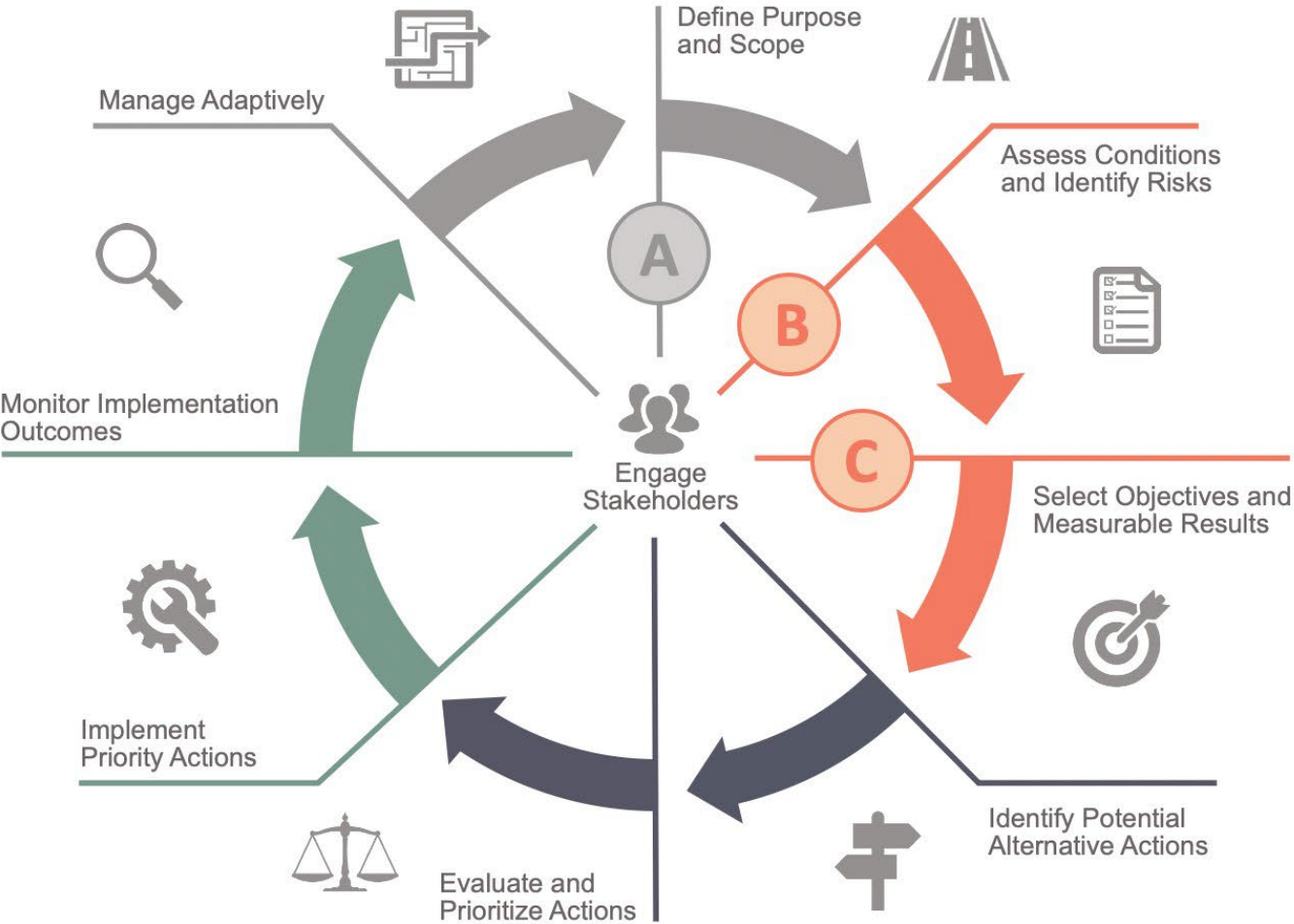
River Network grows and strengthens a transformational national network of water, justice, and river advocates.

*We envision a powerful and inclusive movement that ensures abundant clean water for all people and nature to thrive.*

Access resources on our website: [www.rivernetnetwork.org](http://www.rivernetnetwork.org). To learn more about our focus areas and how we're working to achieve them, please explore our Strategic Plan: <https://bit.ly/RNStrategicPlan>



# Background



➤ What are the primary issues/needs driving the planning effort?

➤ What do you hope the planning effort will yield? Streamflow management targets? Prioritized recommended actions?

➤ Does the scope and geographic scale of the plan limit your ability to investigate the primary issues/needs in sufficient detail?

➤ How do assessment results help identify or clarify linkages between environmental variables?

➤ What risks do you perceive? Is there consensus among stakeholders?

➤ Do the assessment results suggest that streamflows are an important control or limiting factor for issues/needs of concern?

➤ Can you define issue-based objectives that reflect a perceived risk or some undesirable condition(s) for an environmental attribute you care about?

➤ If your objectives implicate streamflow targets or flow regime management, can you articulate the linkages between changes to the flow regime and the primary issues/needs of concern?

➤ Which parts of the flow regime appear most strongly tied to your primary issues/needs of concern?