AGENDA

UPPER YAMPA WATER CONSERVANCY DISTRICT
SPECIAL BOARD OF DIRECTORS MEETING
WEDNESDAY, OCTOBER 19, 2022 (9:00 AM)
CATAMOUNT RANCH AND CLUB
30215 WATERS EDGE TRAIL
ONLINE MEETING:

HTTPS://US06WEB.ZOOM.US/J/81633922814?PWD=WMJAT1JTWVZQVMRQBTVDMMPNNNJ6ZZ09

THE UPPER YAMPA WATER CONSERVANCY DISTRICT REQUESTS THAT UNVACCINATED PEOPLE ATTENDING THE SPECIAL BOARD OF DIRECTORS MEETING AT CATAMOUNT RANCH AND CLUB WEAR A MASK.

INSTRUCTIONS ON HOW TO JOIN A ZOOM MEETING FOLLOW THE AGENDA

A Board of Directors meeting packet is available for public review on our website at https://upperyampawater.com/agendas-and-meeting-documents/ by the Friday before the meeting. Amendments to the Agenda and new documents that are generated or submitted after the original posting of the meeting materials will be posted under "Additional Documents" on the website for the relevant meeting.

QUESTIONS ON AGENDA AND/OR BOARD MATERIALS: Members of the public or Board of Directors with questions on the agenda or meeting materials, including the consent agenda, are welcome to contact the General Manager at the District offices prior to the meeting. You may reach the General Manager at: arossi@upperyampawater.com or (970) 871-1035 Ext. 2.

MEETING PROCEDURE: Comments from the Public are welcome at two different times during the course of the meeting: 1) Comments no longer than three (3) minutes on items **not** scheduled on the Agenda will be heard under Public Input and Comment; and 2) Comments no longer than three (3) minutes on all scheduled public hearing items will be heard following the presentation. Please wait until you are recognized by the President. With the exception of subjects brought up during Public Input and Comment, on which no action will be taken or a decision made, the Board may take action on, and may make a decision regarding, ANY item referred to in this agenda, including, without limitation, any item referenced for "review", "update", "report", or "discussion" whether or not listed as an "Action Item**."**

8:30 AM Breakfast

(1) **9:00 AM** Establishment of Quorum and Call to Order
(2) **9:00 AM** Approval of Agenda for Meeting **Action item**
(3) **9:05 AM** Public Input and Comment
The Board will make no decision nor take action, except to direct the General Manager. Those addressing the Board are requested to identify themselves by name, organization, if any, and address. Comments shall not exceed three (3) minutes.
(4) **9:10 AM** Employee Handbook Review by General Counsel

(5) **9:25 AM** Yampa River Basin Data and Analysis Review
   a. Yampa Basin Irrigation Patterns
      i. Bear River and Yampa Above Stagecoach

10:00 – 10:15 AM Break

   b. Update on Colorado Water Conservation Board Activities
   c. Coordinated Reservoir Release Options Study and Discussion

11:15 AM – 12:15 PM Lunch Break

(6) **12:15 PM** UYWCD 2023 Budget and Work Plan Discussion
   a. Identified 2023 Work Efforts and Additional Work Efforts Discussion
   b. Yampa River Basin Water User Financial Support Options
   c. 2023 Budget Review
      i. UYWCD Tax Revenue Discussion
      ii. 2023 Budget Review
(7) **2:30 PM** New Business (Limited to emergency matters that came up during the course of the meeting) **Action item**
(8) **2:40 PM** Executive Sessions:
   a. Executive session under CRS § 24-6-402(4)(b) to discuss legal issues on Water Resumes, Water Cases, Contract Negotiations and_____(insert description) . Mere presence or participation of an attorney at an executive session is not sufficient to satisfy the requirements of CRS § 24-6-402(4)(b). Executive sessions to discuss legal matters are not recorded.
   b. Executive session under CRS § 24-6-402(4)(e)(I) for the purpose of determining positions relative to matters that may be subject to negotiations; developing strategy for negotiations; and instructing negotiators with respect to _____(insert brief description). This session will be recorded, and a copy of the recording maintained for not less than 90 days.
(9) **2:50 PM** Board Actions in Regard to Executive Session
(10) **2:55 PM** Determination of Next Meeting(s) Agenda(s)
(11) **3:00 PM** Adjournment

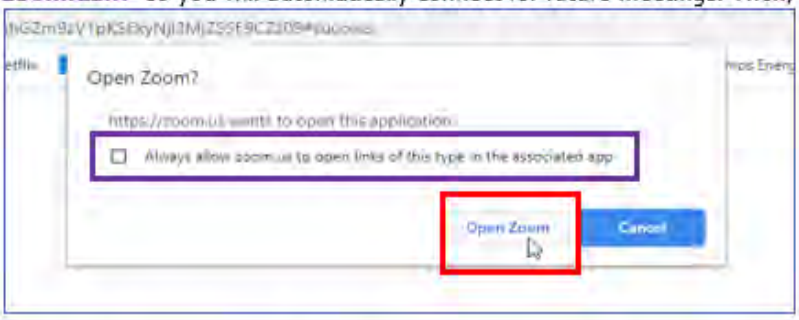
How to join a Zoom meeting

Join via "Join Zoom Meeting" link:

To join a Zoom meeting, click on the meeting link that has been sent to you by the host:

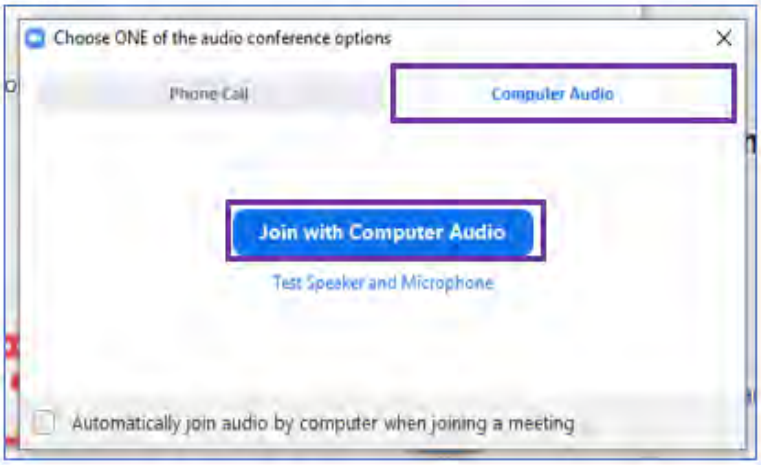
Join Zoom Meeting
https://zoom.us/j/92536171054?pwd=MGxQRjZaTWp5U0Q4VUh6VmJ5blExQT09

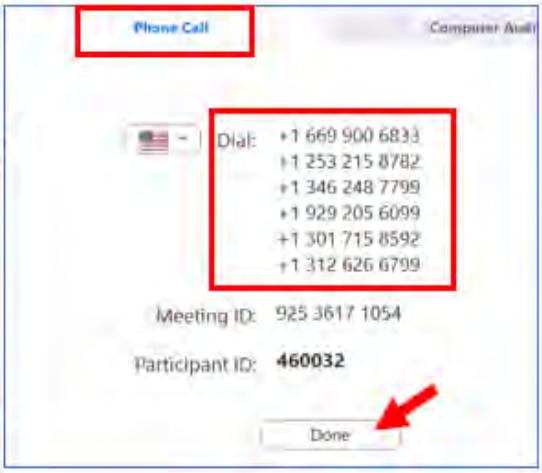
If you have not used Zoom before, you may receive this dialogue box to open Zoom. First, click on "**always allow zoom.us...**" so you will automatically connect for future meetings. Then, click on "**Open Zoom**" and follow the prompts.



Once you are connected to Zoom, you will need to choose your audio conference option. To join via your computer, click on "**Computer Audio**" and then "**Join with Computer Audio**".

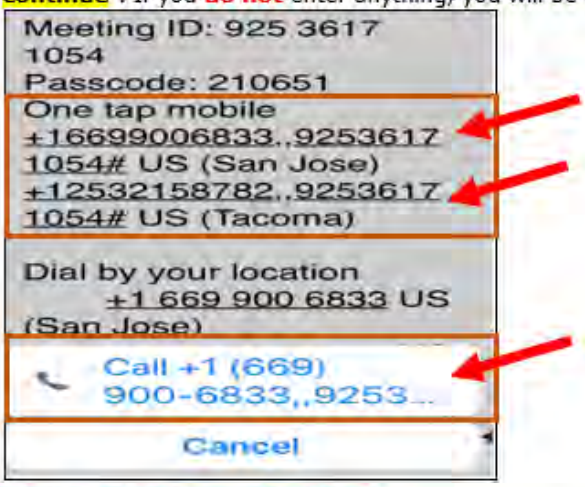
To use your cell phone or landline, click on "**Phone Call**" and then choose a number from the list. Once you dial the number, you will be asked for the Meeting ID and Participant ID to enter the meeting. Click on "**Done**" once you are connected to the Zoom meeting. Or, you can use the "**One tap mobile**" option, see below, to connect via your cell phone.



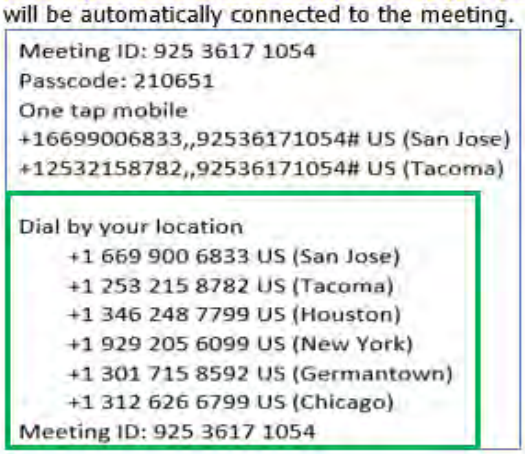


Join via cell phone with "One tap mobile":
If you will be joining a Zoom meeting via your cell phone, click one of the "**One tap mobile**" links. Then click on "**Call +1...**". You will hear a request to "**enter your Meeting ID followed by pound (#)**". You **do not** need to enter the ID as the link will do this automatically for you.

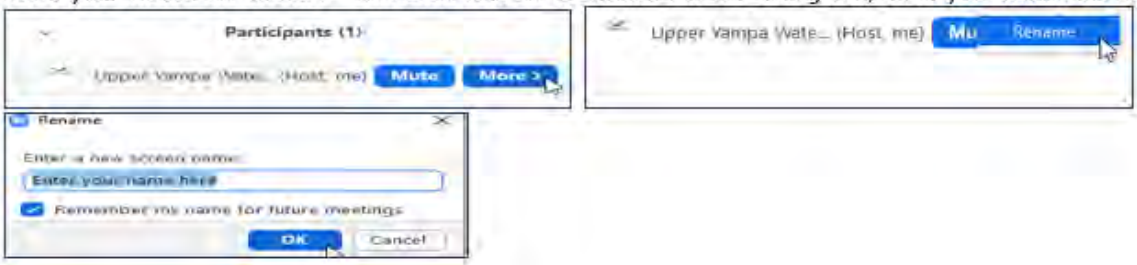
You will be asked if you are a participant and to "**Please press pound (#) to continue**". You **must** press the pound key (#). Then you will be asked to "**Enter your Participant ID followed by pound (#) or just press pound (#) to continue**". If you **do not** enter anything, you will be automatically connected to the meeting.



Join via "Dial by your location":
If you will be joining a Zoom meeting via your cell phone or landline, you can choose any of the numbers below to access the meeting. Once you dial the number you will be asked to "**Enter your Meeting ID followed by pound (#)**". Then, you will be asked to "**press pound (#) if you are a participant**". Finally, you will be asked to "**Enter your Participant ID followed by pound (#) or just press pound (#) to continue**". If you **do not** enter anything, you will be automatically connected to the meeting.



Be sure you are identified properly:
Once in Zoom, be sure that you are identified properly. If you need to change, in "**Participants**" click on your ID and hover your mouse on "**More >**" and then click on "**Rename**". In the dialog box, enter your name and click "**OK**".



Contact Deb Bastian for any questions
- Email: dbastian@upperyampawater.com
- Phone: 970-819-0189

PUBLIC INPUT AND COMMENT

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UPPER YAMPA WATER
CONSERVANCY DISTRICT

BOARD COMMUNICATION FORM

From: Bob Weiss, General Counsel

Date: October 19, 2022

Item: Employee Handbook Review by General Counsel

_____ DIRECTION
X____ INFORMATION
_____ MOTION
_____ RESOLUTION

I. Request/Issue and Background Information:
A verbal presentation will be provided to the Board by General Council Weiss and Nicole Stjernholm, Esq. from the Employers Council regarding the possibility that provisions in the Employee Handbook could be interpreted as a contractual obligation of the District notwithstanding the at-will employment disclaimer provided in the handbook.

II. Summary and Alternatives:
n/a

III. Staff Recommendation:
n/a

IV. Legal Issues:
n/a

V. Consistency with Board Goals and Policies:
n/a

UPPER YAMPA WATER
CONSERVANCY DISTRICT

BOARD COMMUNICATION FORM

From: Andy Rossi, general Manager

Date: 10/06/22

Item: Yampa River Irrigation Patterns: Bear River, Yampa above Stagecoach Reservoir

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_____ DIRECTION
__X__ INFORMATION
_____ MOTION
_____ RESOLUTION

I. Request/Issue and Background Information:

The Upper Yampa Water Conservancy District (UYWCD) retained Wilson Water Group (WWG) to conduct an analysis of the intra-seasonal irrigation patterns for the Bear River and Yampa above Stagecoach sections of the Yampa River system. WWG used the existing publicly available Colorado Department of Water Resources (CDWR) diversion data for 2021 to conduct a temporal and quantification analysis. The CDWR diversion data, diversion locations, and associated irrigated acreages for the main stem of the Yampa River system for the reaches considered are displayed on the maps attached with this communication. A verbal presentation and discussion of the data will be led by the UYWCD General Manager.

II. Staff Recommendation:

NA

III. Legal Issues:

NA

IV. Consistency with Board Goals and Policies:

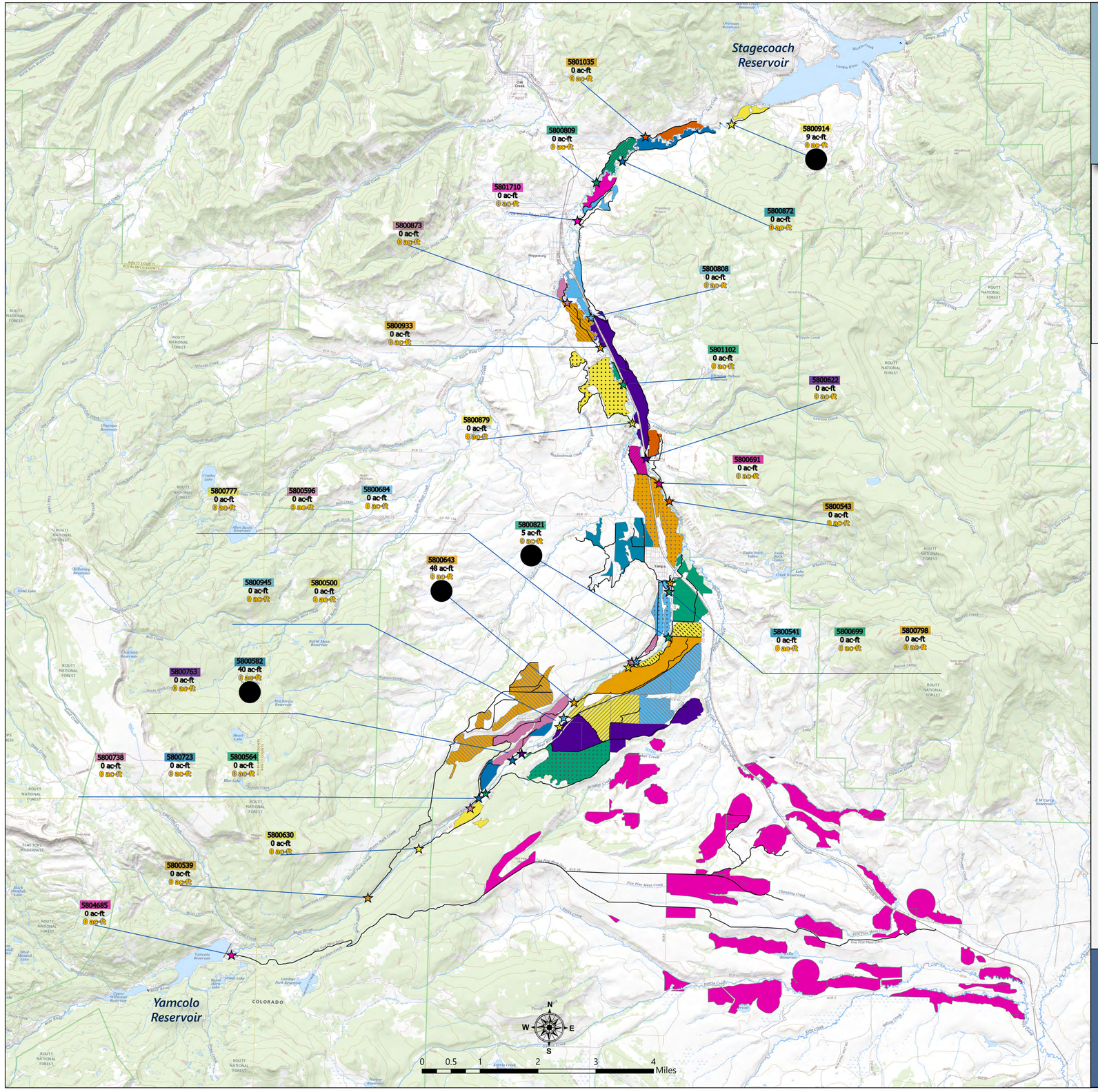
UYWCD SP Objective 4.4

Attachments:

Attachments: 2021 Irrigation Season Data Maps

Upper Yampa Water Conservancy District

April 2021
Direct Flow and Reservoir Diversions



Map Legend

UYWCD Headgate Pie Chart*

Direct Flow Diversions

Reservoir Diversions

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★ Headgate locations are shown on the map as stars. The stars are color-coded to match the irrigated acreage associated with each headgate.

Irrigation Ditch

Direct flow and reservoir daily diversion time series for twelve headgates with the most associated irrigated acreage.

Black Solid Line = Direct Flow Diversions
Yellow Dashed Line = Reservoir Diversions

Date: October 10, 2022

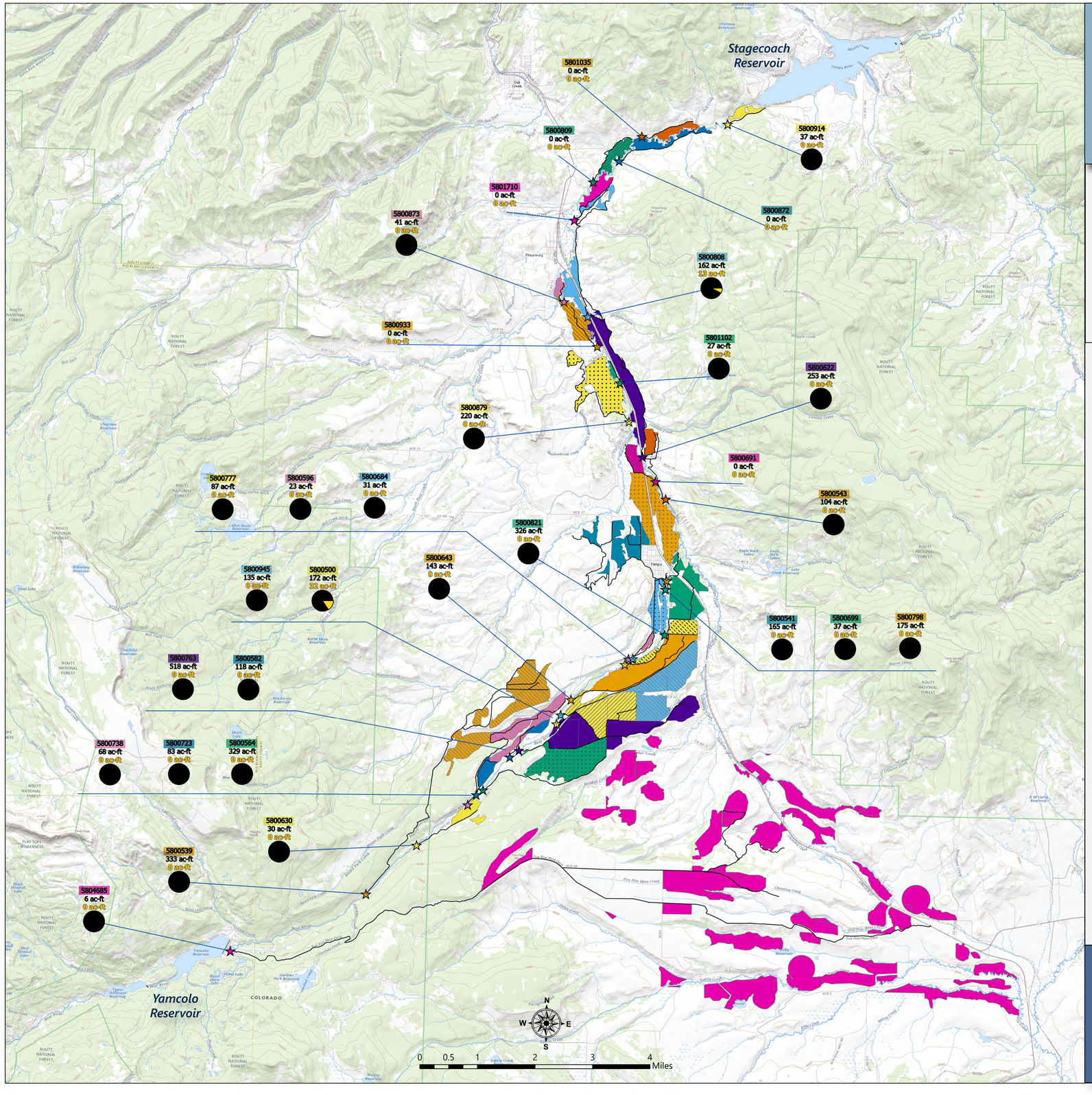
Sources: Colorado DWR (CDSS); USGS Topographic Basemap; USGS NHD

Datum/Projection: NAD83/UTM Zone 13N

UPPER YAMPA WATER CONSERVANCY DISTRICT

Upper Yampa Water Conservancy District

May 2021
Direct Flow and Reservoir Diversions



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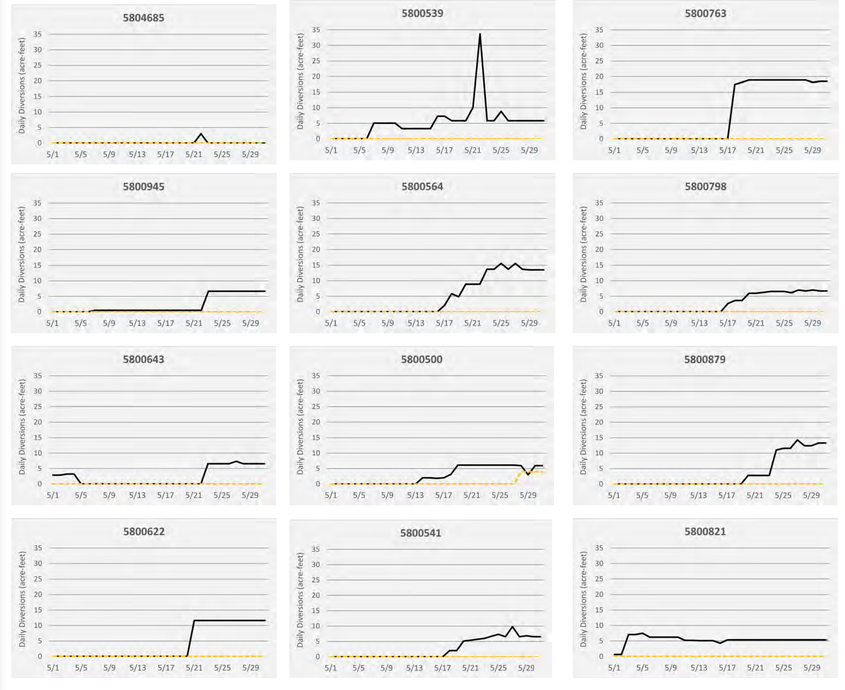


Date: October 10, 2022

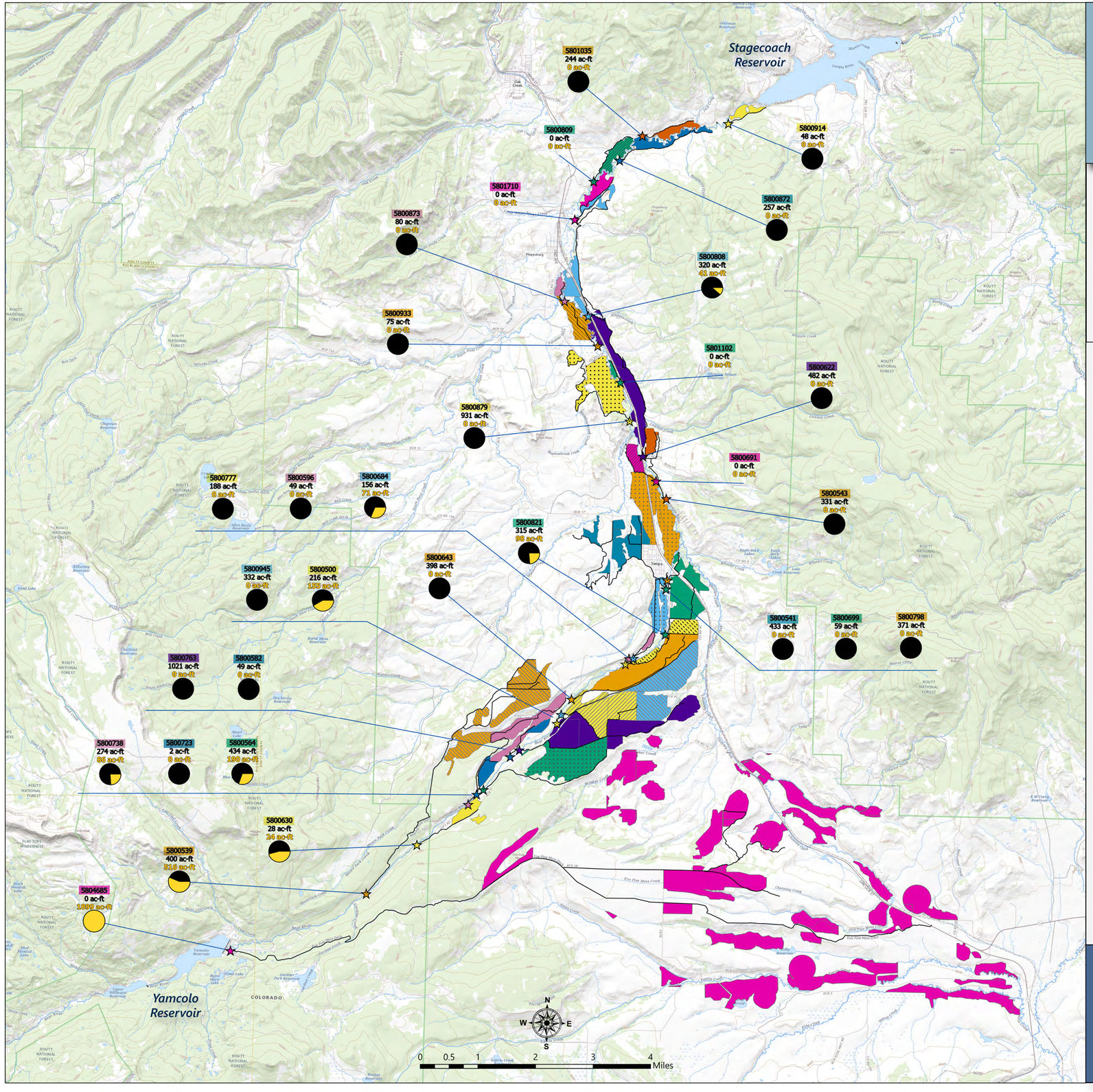
Sources: Colorado DWR (CDSS); USGS Topographic Basemap; USGS NHD

Datum/Projection: NAD83/UTM Zone 13N

UPPER YAMPA WATER CONSERVANCY DISTRICT

Upper Yampa Water Conservancy District

June 2021
Direct Flow and Reservoir Diversions



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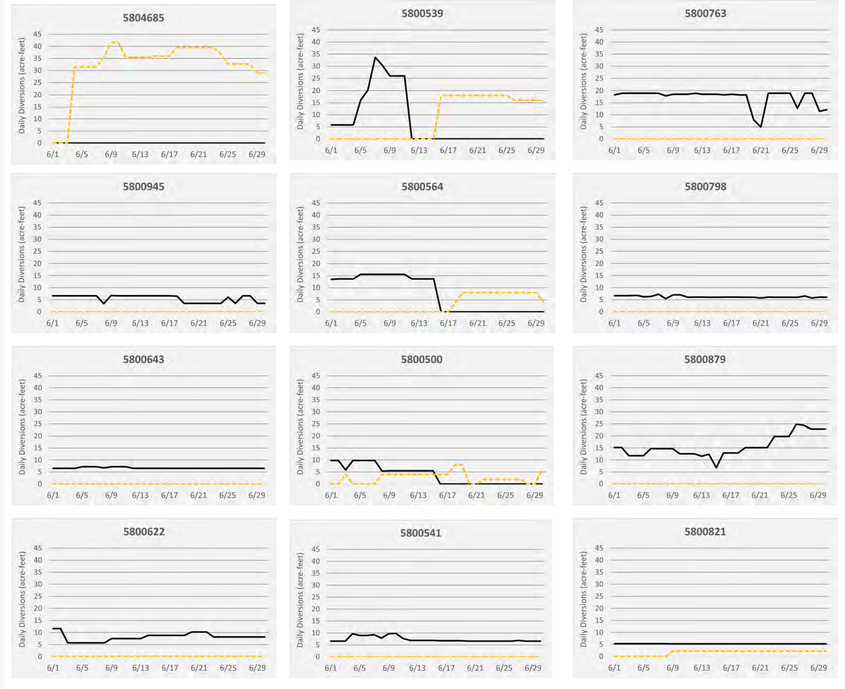


Date: October 10, 2022

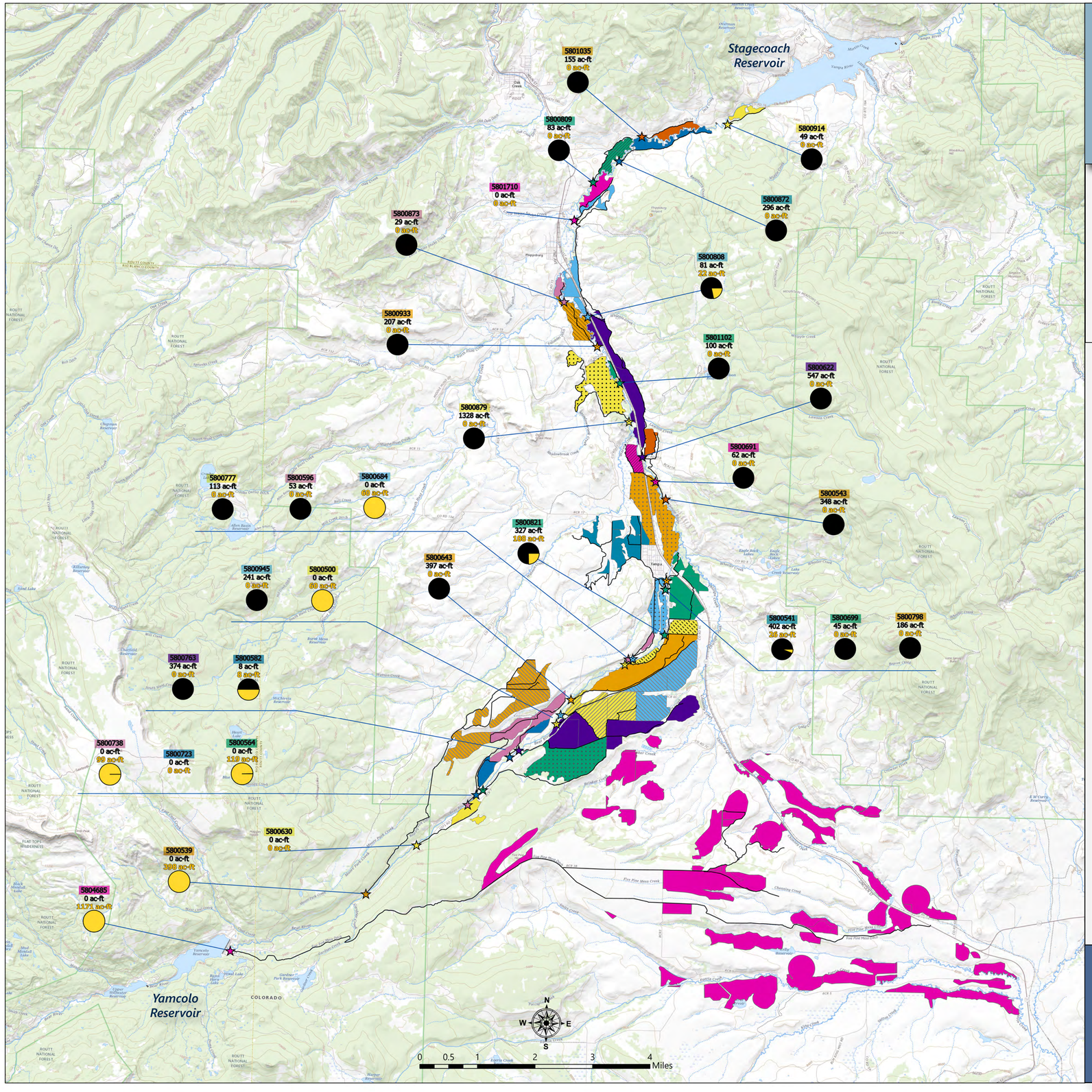
Sources: Colorado DWR (CDSS); USGS Topographic Basemap; USGS NHD

Datum/Projection: NAD83/UTM Zone 13N

UPPER YAMPA WATER CONSERVANCY DISTRICT

Upper Yampa Water Conservancy District

July 2021
Direct Flow and Reservoir Diversions



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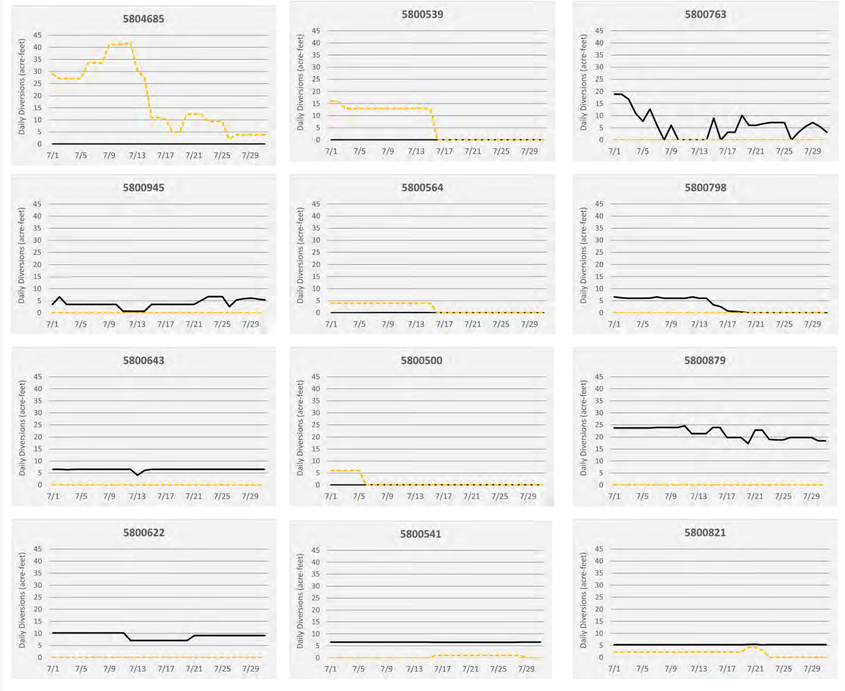


Date: October 10, 2022

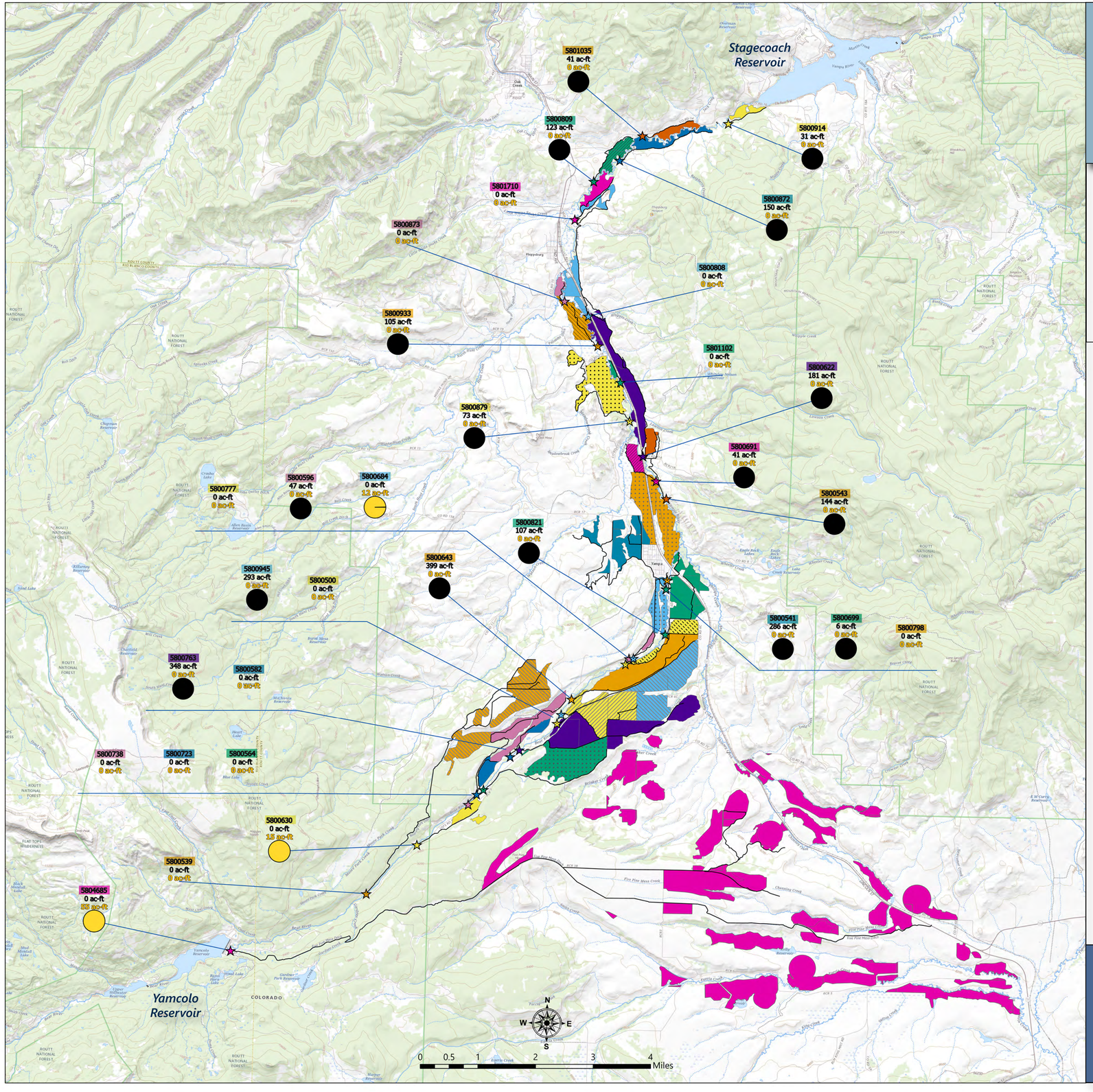
Sources: Colorado DWR (CDSS); USGS Topographic Basemap; USGS NHD

Datum/Projection: NAD83/UTM Zone 13N

UPPER YAMPA WATER CONSERVANCY DISTRICT

Upper Yampa Water Conservancy District

August 2021
Direct Flow and Reservoir Diversions



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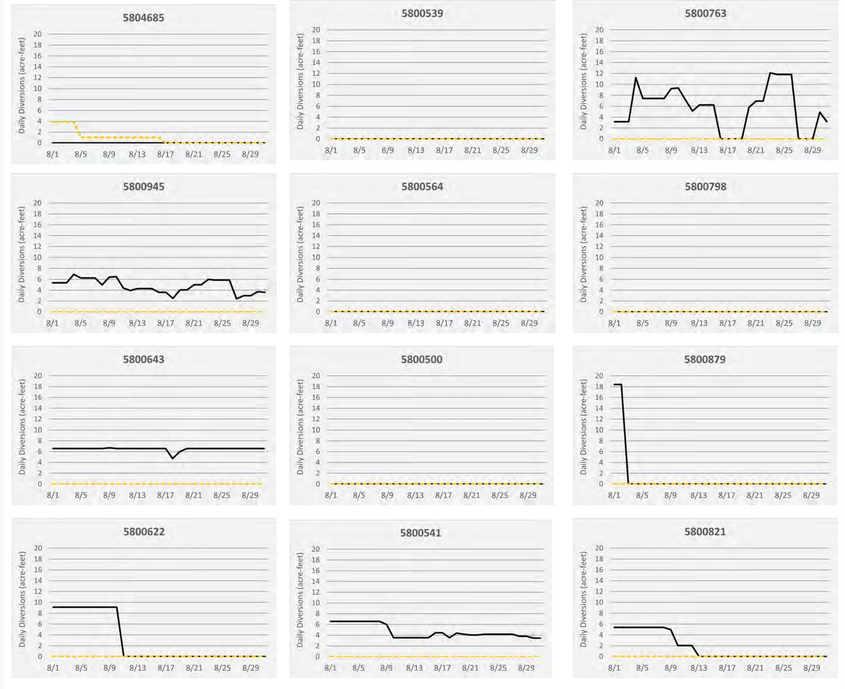


Date: October 10, 2022

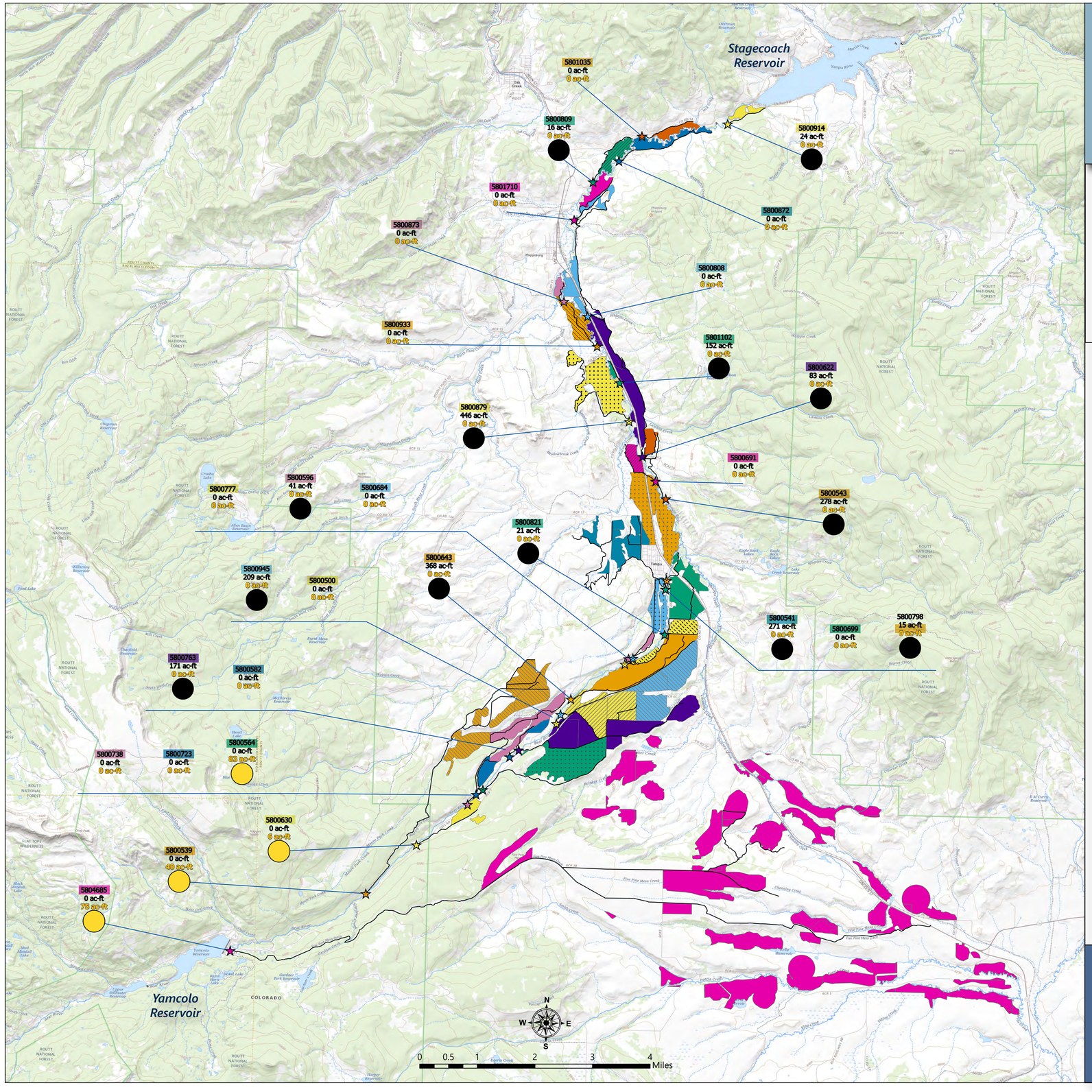
Sources: Colorado DWR (CDSS); USGS Topographic Basemap; USGS NHD

Datum/Projection: NAD83/UTM Zone 13N

UPPER YAMPA WATER CONSERVANCY DISTRICT

Upper Yampa Water Conservancy District

September 2021
Direct Flow and Reservoir Diversions



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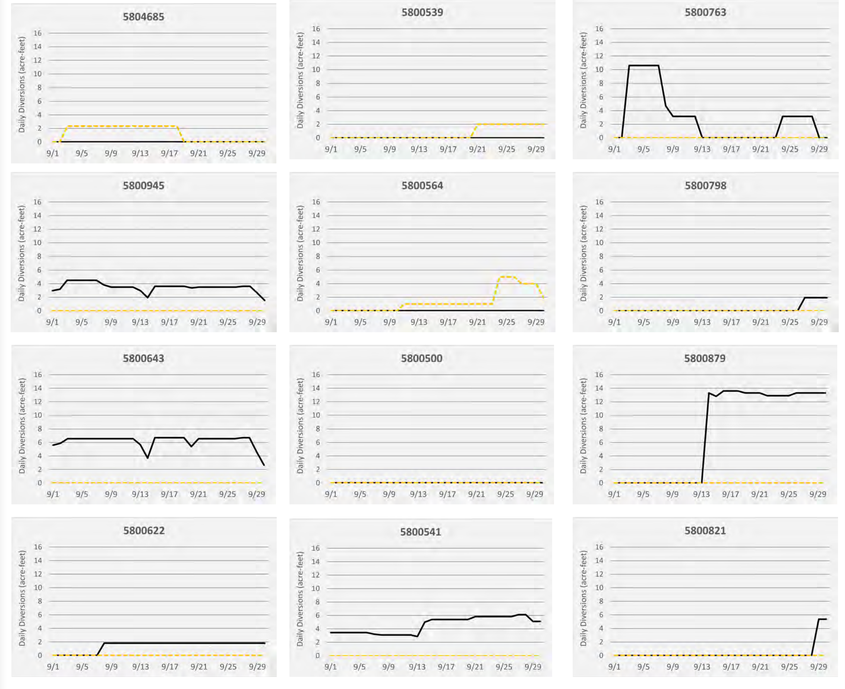

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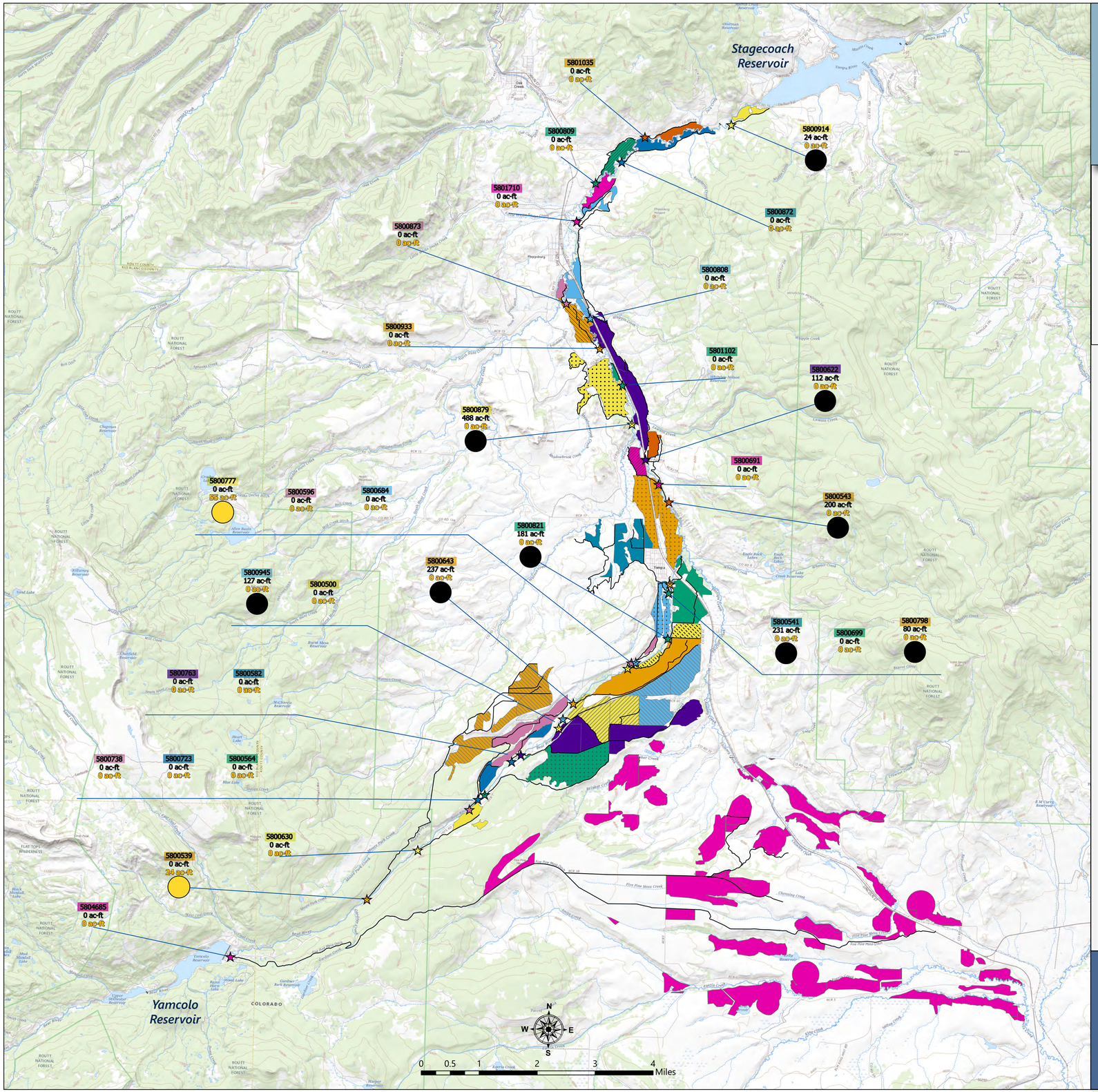
UPPER YAMPA WATER CONSERVANCY DISTRICT

Upper Yampa Water Conservancy District

October 2021
Direct Flow and Reservoir Diversions



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UPPER YAMPA WATER CONSERVANCY DISTRICT

UPPER YAMPA WATER
CONSERVANCY DISTRICT

BOARD COMMUNICATION FORM

From: Andy Rossi, General Manager

Date: 10/10/22

Item: **2021 – 2022 Yampa River Basin Reservoir Release Activities**

_____ DIRECTION
__X__ INFORMATION
_____ MOTION
_____ RESOLUTION

I. Request/Issue and Background Information:

A presentation on the 2021 – 2022 Yampa River Basin Reservoir Release Activities will be given by the Upper Yampa Water Conservancy District General Manager, Andy Rossi. Discussion will follow.

II. Staff Recommendation:

NA

III. Legal Issues:

NA

IV. Consistency with Board Goals and Policies:

UYWCD SP Objectives 4.4, 4.7, 5.2

Attachments:

Presentation Power Point Slides
Yampa Storage Modeling Final Report
Out of District Water Delivery Memo
Legal Discussion of Flow Maintenance Releases

Yampa Storage Modeling and Reservoir Coordination

October 19, 2022

Reservoir Coordination Discussion Agenda

- 2021 – 2022 Work Efforts Review
  - Storage Modelling Report Final Results
    - Baseline
    - "Alternative 2"
    - "Alternative 3"
  - CWT/CWCB-UYWCD Stagecoach Reservoir Contract
    - 2022 CWT Releases and Existing Elkhead Reservoir Releases
  - IWMP Workgroup and Final Objective
- Future Options?

2021 – 2022 Reservoir Coordination

Completed Work Efforts Review

Completed Efforts

2021-2022

- 2021 Storage Modeling Report
- CWT/CWCB-UYWCD Stagecoach Reservoir Contract
- IWMP Final Report Objective

Yampa Storage Modeling Results

2021 Final Report

Baseline

- Current conditions imposed on historical hydrology and weather
- 2010 irrigated acreage
  - Crop type
  - Irrigation methods
- Modified Blaney-Criddle
  - Observed monthly temperature and precipitation
- Present-day (~2015) municipal and industrial demands
  - Average monthly demand pattern
- Current reservoir operations

Alt 2

- "Light weight" version of the BIP Update Alternative 2
- Elkhead Reservoir
  - Increase release limit to Lower Yampa Reach from 50 cfs to 75 cfs
  - Note – limit does not impact releases to other users
  - If needed, release from Tri-State 2nd and Tri-State 1st pools to Lower Yampa Reach
  - Release to ag uses DS of Elkhead from River District pool, limited to 25 cfs
- Stagecoach Reservoir
  - Release from General Supply pool to Lower Yampa Reach (Maybell, after contract holders), limited to 100 cfs
- Transit loss applied to releases

Alt 3

- Same as Alt 2 EXCEPT
- Elkhead Reservoir
  - Increase release limit to Lower Yampa Reach from 75 cfs to 100 cfs

Account	Volume (acre-feet)	Destination
Elkhead – CWCB	5,000	Lower Yampa Reach
Elkhead – Fish Lease	2,000	Lower Yampa Reach
Elkhead – TriState 1	8,408	Lower Yampa Reach
Elkhead – TriState 2	2,500	Lower Yampa Reach
Elkhead – River District	2,457	Ag
Stagecoach – General Supply	4,000	Lower Yampa Reach

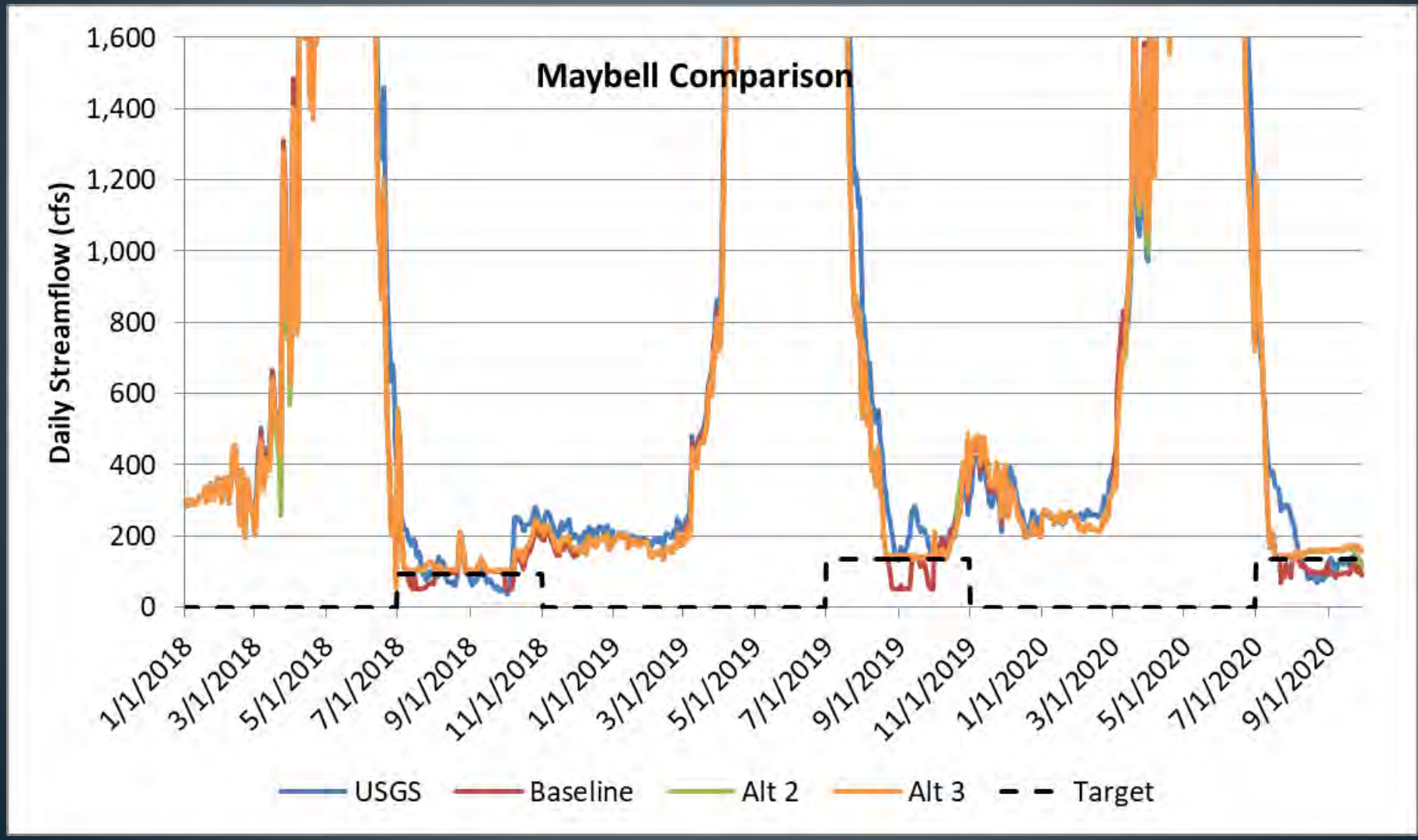
Lower Yampa Critical Habitat Reach Streamflow Stats

Percent of Days that Streamflow Target is Met

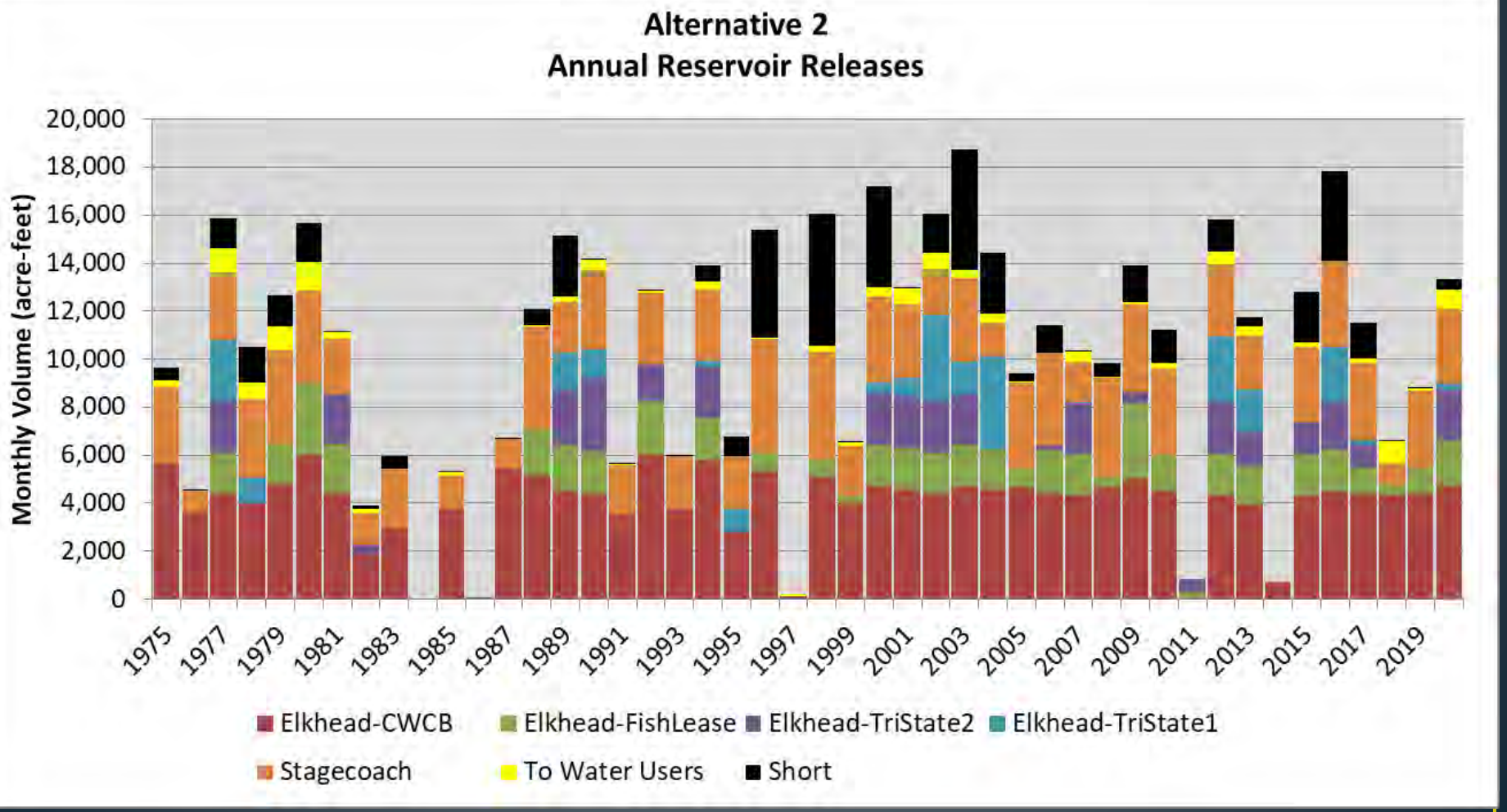
Scenario	July	August	September	October
Historical	92%	81%	69%	91%
Baseline	82%	56%	32%	82%
Alternative 2	100%	94%	76%	90%
Alternative 3	100%	98%	91%	94%

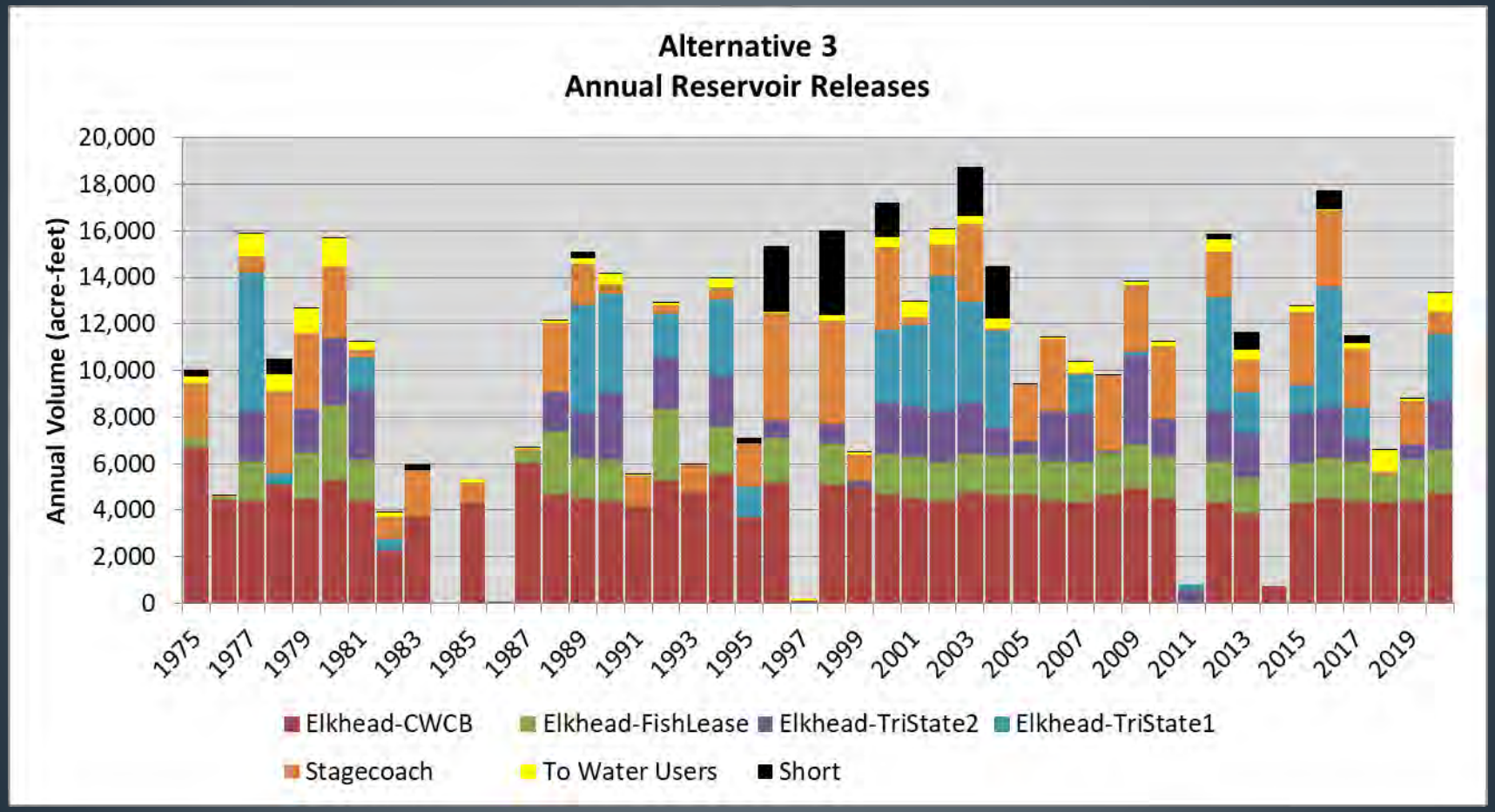
- Fewer days are met under Baseline → more aggressive CU
- Alt 2 improves conditions over Historical and Baseline
  - Historical and Baseline: 7,000 acre-feet of storage and 50 cfs limit
  - Alt 2: ~21,908 acre-feet of storage, 75 cfs limit on Elkhead, 100 cfs limit on Stagecoach
  - Alt 3: ~21,908 acre-feet of storage, 100 cfs limit on Elkhead, 100 cfs limit on Stagecoach

Daily Streamflow Results



Alternative 2
Maybell - Annual




Alternative 3
Annual Reservoir Releases
Annual Volume (acre-feet)
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
Elkhead-CWCB
Elkhead-FishLease
Elkhead-TriState2
Elkhead-TriState1
Stagecoach
To Water Users
Short

Reservoir Releases to Lower Yampa Reach

Alternative 2

- 2000 – 2020 Annual Volumes
- Total Period Statistics
- Acre-feet per year

Date	Elkhead - CWCB	Elkhead - FishLease	Elkhead - TriState2	Elkhead - TriState1	Stagecoach	Total Release
Min (1975-2020)	0	0	0	0	0	0
Median (1975-2020)	4,327	1,599	143	0	2,423	9,143
Max (1975-2020)	4,410	1,735	2,152	4,604	4,572	15,799
Year of Max	1980	2010	2016	2012	1988	2012

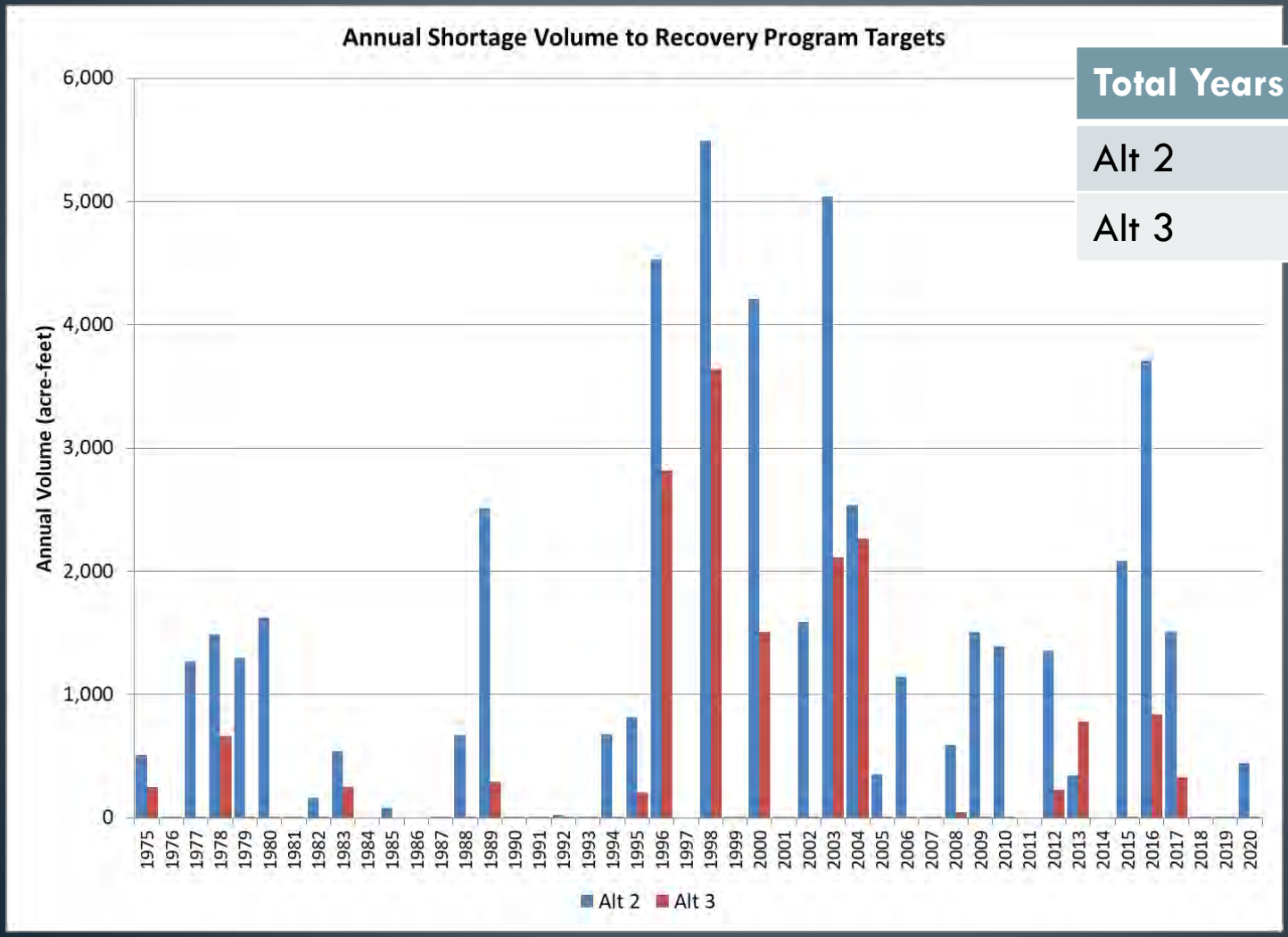
Reservoir Releases to Lower Yampa Reach

Alternative 3

- 2000 – 2020 Annual Volumes
- Total Period Statistics
- Acre-feet per year

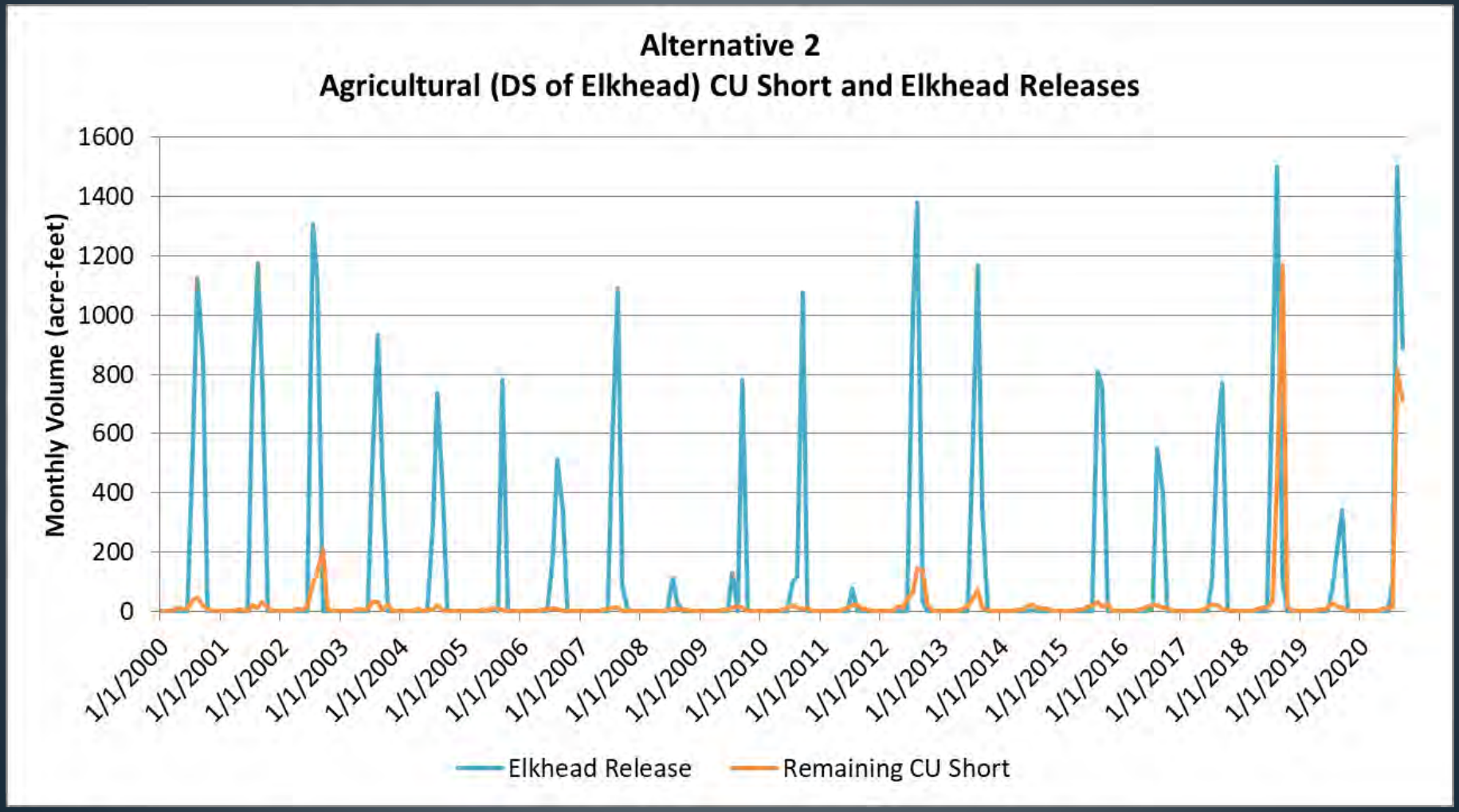
Date	Elkhead - CWCB	Elkhead - FishLease	Elkhead - TriState2	Elkhead - TriState1	Stagecoach	Total Release
Min (1975-2020)	0	0	0	0	0	0
Median (1975-2020)	4,334	1,714	1,398	0	875	9,482
Max (1975-2020)	4,412	1,743	2,168	5,842	4,410	17,499
Year of Max	1980	1998	2010	2003	1988	1988

Compare Shortages to Lower Yampa Reach



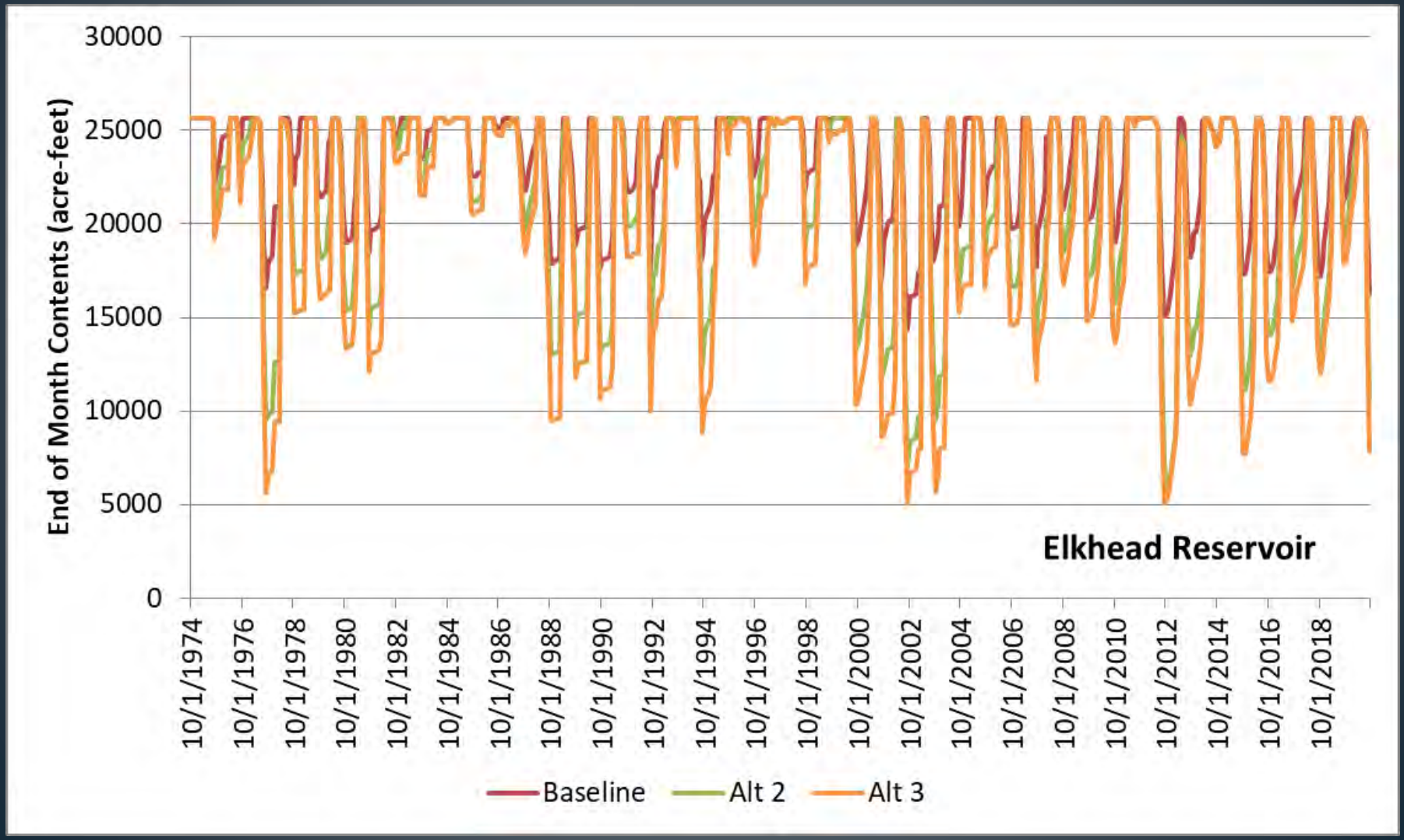
Total Years with Shortage	
Alt 2	30
Alt 3	17

Alternative 2
Release to Ag and Remaining Shortages

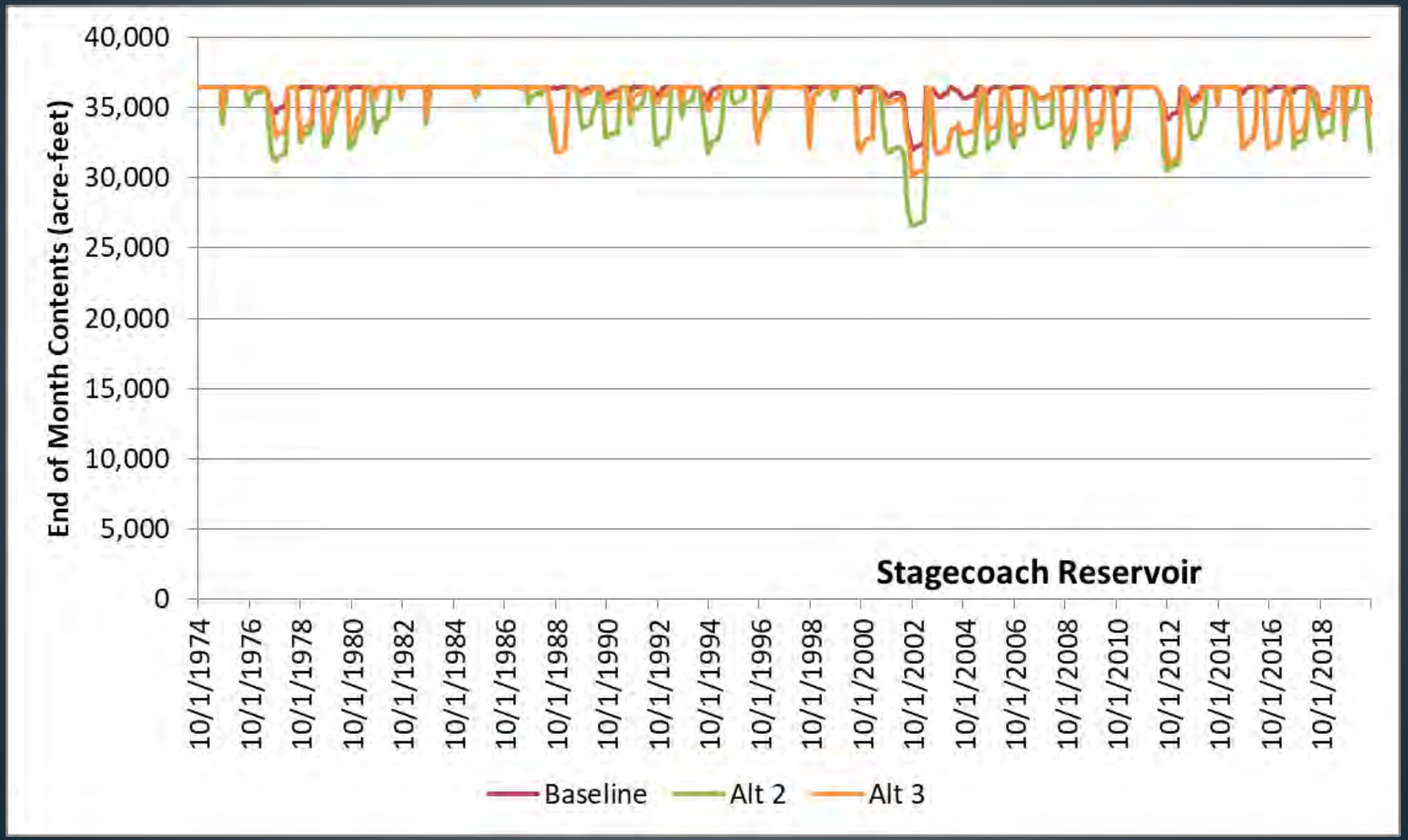


Alt 3 is almost identical

Reservoirs
Elkhead: 1975 - 2020



Reservoirs
Stagecoach: 1975 - 2020



CWT/CWCB-UYWCD Stagecoach Reservoir Contract

Existing Reservoir Operations

- Stagecoach: CWCB/CWT
- Elkhead: CWCB/FWS

- Stagecoach Reservoir CWCB/CWT Contract:
  - 10-Year Contract (Renewable up to 30-Years)
  - Flexible Storage Supply Allocation
  - "5 in 10" Target = Yampa River ISF (Stagecoach – Catamount)
  - 2022 Releases: ~ 3,200 AF
- Elkhead Reservoir CWCB/FWS Storage Pools, 2022:
  - CWCB "Fish Pool": All 5,000 AF Released
  - "Short-Term Lease" Pool: 1,112 AF Released

2022 Total Combined Yampa System reservoir Releases for Flow Maintenance:

~ 9,300 AF

IWMP Final Report Objective

IWMP FINAL REPORT

- Recommendation 14
- https://sites.google.com/view/ywgroundtable/final-report

"Coordinate reservoir operations to meet irrigation & environmental shortages: Identify opportunities that increase the utilization of existing stored water to help alleviate existing and future irrigation water and environmental flow shortages."

Future Reservoir Coordination Options

Future Options

- Are current practices enough?
- Access to more storage?
- Alternative delivery mechanisms needed?

- Agricultural Bulk Contract – Stagecoach Reservoir?
- New Junior ISF on Yampa Mainstem above Confluence with Elkhead Creek?
- Steamboat Lake Operations?
- Others?

Yampa Storage Modeling Report

And

2020 Look-Back Technical Memo

September 2021

Final

Prepared by Wilson Water Group for the Colorado River District, Tri-State Generation and Transmission, and Upper Yampa Water Conservancy District

Table of Contents

Yampa Storage Modeling Final Report

Background

In 2018, the Yampa River experienced the first mainstem call. A below-average snowpack combined with dry conditions throughout the basin resulted in low streamflow in the lower portion of the Yampa River. On September 4, 2018, Colorado Division of Water Resources (DWR) set the calling location as Lily Park Ditch, located on the Yampa River mainstem just upstream from the confluence with Little Snake River. The call was active until September 26, 2018. During this period, the call priority ranged from August 24, 1950 to January 9, 1955. Upstream diversions for junior water rights were curtailed to enable the limited native flow to reach the Lily Park Ditch senior water right.

In 2020, DWR again set the calling location as Lily Park Ditch. The call was active from August 25 through September 3. Due to very limited native streamflow, the flows measured by the USGS Yampa River near Maybell gage dropped below the desired levels established by the Recovery Program for the endangered fish species, even though Elkhead Reservoir was releasing up to 75 cfs from the CWCB Fish Pool. The River District and Tri-State made additional releases from Elkhead Reservoir for the benefit of water users that were curtailed, including Craig Station. At the same time, the Upper Yampa Water Conservancy District released 25 cfs from Stagecoach Reservoir leased by the Colorado Water Trust and initiated an early end-of-season reservoir drawdown to increase flow in the Yampa River below Stagecoach Reservoir. These additional releases, supplemented by late season precipitation, allowed the call in 2020 to be lifted more quickly than the call in 2018.

The additional reservoir releases improved conditions for the water users and the endangered fish. The positive community response, and the cooperation among reservoir owners and users, sparked the idea of investigating bulk water releases. The general concept is water users could pool their resources to lease water from Elkhead Reservoir and Stagecoach Reservoir. The releases could supplement agricultural supplies, allowing water users to continue irrigation while supporting flows in the Lower Yampa Critical Reach.

In 2005, the United States Fish and Wildlife Service (USFWS) issued a Final Programmatic Biological Opinion (PBO) on the *Management Plan for the Endangered Fish in the Yampa River Basin* (USFWS 2005). A key component of the Management Plan was the enlargement of Elkhead Reservoir to provide storage water to supplement late-season streamflows through the designated critical habitat reach on the Yampa River, which extends from the City of Craig to the Green River confluence. For the purposes of this report, this critical habitat reach will be referred to as the “Lower Yampa Reach”. The Recovery Program takes a collaborative approach to managing releases from Elkhead Reservoir. A weekly phone call is held to discuss conditions and determine the release rate. Generally, decisions are made based on the real-time observed streamflow at the USGS gage Yampa River near Maybell.

Introduction

The Colorado River District (River District), Tri-State Generation and Transmission (Tri-State), and the Upper Yampa Water Conservancy District (UYWCD) (collectively referred to as the funders) joined together to fund the Yampa Storage Modeling project, identify reservoir release options, and test various scenarios using the daily Yampa River StateMod model. The funders also invited Colorado Ag Water Alliance (CAWA) and the Colorado Water Conservation Board (CWCB) to participate in meetings and discussions. Preliminary results were presented to the funders and subsequently shared with the Recovery Program team. This final report presents the final scenarios investigated, modeling assumptions, and findings.

The goal of the project was to understand the benefits and risks to increasing the reservoir supply available to agricultural users in the lower Yampa and to the Recovery Program. This modeling is intended to be exploratory in nature and only addresses the technical challenges. The funders were interested in gathering data from a technical point of view to help decide if the benefits warranted further investigation. This project does not address any legal, policy, or funding issues.

Two scenarios were considered by the funders. These scenarios built on the recently completed Yampa-White-Green Basin Roundtable Basin Implementation Plan Update (BIP Update). For the BIP Update, Alternative 2 considered new releases from existing storage. The funders wanted to further explore this modeling concept on a daily time step. Under Alternative 2, the River District pool in Elkhead Reservoir is made available to downstream agricultural users. Tri-State's 1st and 2nd pool in Elkhead Reservoir are made available to the Recovery Program, as is the General Supply account in Stagecoach Reservoir. The maximum Elkhead Reservoir release rate to the Recovery Program is increased from 50 cfs to 75 cfs. Additionally, the funders developed Alternative 3, in which the maximum Elkhead Reservoir release rate to the Recovery Program is increased from 75 cfs to 100 cfs.

Approach

The funders selected the daily Yampa StateMod model as the modeling platform for this project. The daily Yampa StateMod model was published in 2018 as part of Yampa-White-Green Basin Roundtable Phase 3 Project and is publically available. For this effort, the following updates were made to the model:

- The period of record was extended from September 30, 2013 through September 30, 2020.
- Transit losses on reservoir releases were incorporated.
- Natural flows were further investigated and revised.
- The model was reviewed in detail to confirm correct representation of the Recovery Program representation.
- Stagecoach Reservoir operations and users were revised to be consistent with the 2021 Stagecoach Reservoir Fill and Release Policies document.

The Yampa StateMod model is documented in the Yampa Water Resource Model User's Manual available at https://cdss.colorado.gov/resources/modeling-dataset-documentation and in the Phase 3 Report available at https://yampawhitegreen.com/resources/.

Extend Period of Record

The State of Colorado has established standard modeling approaches to include streamflow, diversion, and reservoir data in models developed for the Colorado Decision Support System (CDSS). These standard approaches were used to extend the daily Yampa model through September 30, 2020. It was noted that end-of-month reservoir content data is sparse for water years 2015 and 2016. Wilson Water Group collected reservoir content data for Elkhead Reservoir from the River District and for Stagecoach Reservoir from UYWCD. Standard filling techniques were used to supplement available records for the other reservoirs represented in the model.

The calibration for the additional years was compared to the calibration from 1975 through 2013. The additional years are well-calibrated and comparable to the original model calibration.

Incorporate Transit Loss

CWCB and Division 6 published the "Yampa River Transit Loss Assessment" in June 2020. This report estimated transit gains and losses in the Yampa River from the Yampa River Above Elkhead Creek gage to the Yampa River at Deerlodge Park gage. The Division Engineer adopted the report recommendation that a transit loss of 0.16 percent per mile was appropriate for the Yampa River main stem. Division 6 assesses transit loss for releases from Elkhead Reservoir based on the distance from the confluence of Elkhead Creek and the Yampa River to the release destination. Stagecoach Reservoir releases are assessed transit loss based on the distance from the Stagecoach Reservoir outlet to the release destination. Table 1 shows the river miles and transit losses for Elkhead Reservoir and Stagecoach Reservoir to the Maybell gage. This gage is selected as an example because the Recovery Program generally makes release decisions based on the real-time gage readings at this location.

Table 1: River Miles and Transit Loss

Reach	River Miles (miles)	Transit Loss (%)
Elkhead to Maybell gage	73	11.7%
Stagecoach to Maybell gage	133	21.3%

In StateMod, transit loss is modeled as a fixed percent of the reservoir release to the destination, consistent with administration of reservoir releases in Division 6. Transit loss water is removed from the system to represent increased evaporation from the river, transpiration from riparian plants, and bank loss.

Refine Natural Flows

Natural flows on the main stem Yampa River between Hayden and Craig were refined and updated as part of the modeling effort. The USGS gage 09244490 Yampa River above Elkhead Creek near Hayden that came on-line in April 2004 and is currently active. With the model extension through 2020, this

gage provided about 17 years of additional observed data that allowed natural flows to be refined. This improved the calibration for the most recent period, which was the focus of this effort.

In addition, the USGS gage 09246200 Elkhead Creek Above Long Gulch, near Hayden was added to the model to enhance the representation of inflow to Elkhead Reservoir. The gage is located on the County Road 76 bridge over Elkhead Creek, just upstream of the reservoir. The period of record is from 1996 through present. The addition of the two gages slightly improved the model calibration.

Recovery Program Revisions

The Recovery Program streamflow targets were discussed and updated for the modeling effort. The Recovery Program considers the forecasted streamflow from April through July at the Maybell gage to assign the year type as wet, average, or dry. The wettest 25 percent of years are assigned as wet years and the driest 25 percent of years are assigned as dry years. Table 2 reports the Recovery Program streamflow targets by year type. The Recovery Program began operating supplemental releases from Elkhead Reservoir in 2007. Generally, the Recovery Program focuses on supplementing streamflow from July through October. WWG received the historical targets and the volume of Elkhead Reservoir releases from the Recovery Program (personal communication with Don Anderson, 2021).

Table 2: Recovery Program Streamflow Targets for the Lower Yampa Reach by Year Type

Year Type	Streamflow Target (cfs)
Wet	200
Average	134
Dry	93

In StateMod, annual historical natural flow at the Maybell gage location is an input to the model; therefore, forecasting is not required. Natural flow values are available from water year 1909 through 2020. The model year-type estimates, using the same percentages of wet, dry, and average year types, are compared to the historical forecasted values in Table 3. There are three years that do not match. StateMod set 2008 as year type "wet" while the Recovery Program forecast was "average". In 2014 and 2019 StateMod set the year type as "average" and the Recovery Program forecast estimated both years as "wet". Since the primary concern of the project is to improve dry year conditions, WWG did not adjust natural flow estimates year-types to match the Recovery Program forecast.

Table 3: Recovery Program Year Type Comparisons

Year	Target Minimum Flow (cfs)		Historical Elkhead
	StateMod	Historical	Release (af)
2007	93	93	5,000
2008	200	134	5,005
2009	134	134	5,000
2010	134	134	5,000
2011	200	200	1,822[#]

2012	93	93	6,583
2013	93	93	5,246
2014	134	200	1,579[#]
2015	134	134	5,000
2016	134	134	5,000
2017	134	134	4,170
2018	93	93	7,000
2019	134	200	5,000
2020	134	134/93	5,923

Released only to briefly augment high flows in 2011 and 2014. Note that 2020 started as an average year and then was revised to a dry year as streamflow declined throughout the irrigation season.

The Baseline model previously represented the streamflow targets at a single point on the Yampa River. However, the "Procedures for Releasing and Administering Water from Elkhead Reservoir to Augment Yampa River Flows for Endangered Fish" (October 3, 2017) report refers to the Lower Yampa Reach. For the purposes of the model, the Lower Yampa Reach extends from the USGS gage Yampa River Near Maybell to the confluence of the Little Snake River. The model determines the necessary supplemental releases from reservoirs based on the lowest streamflow point in this reach, and water released from a reservoir is protected throughout the reach and cannot be diverted by other users. This representation is intended to mimic actual operational decisions that release water primarily based on the observed flow at the Maybell gage and administration which shepherds those flows through the reach. The model may release slightly more water than is strictly needed at the Maybell gage, due to downstream diversions of native streamflow by agricultural users located in the reach.

Stagecoach Reservoir

Operations and users were revised to be consistent with the 2021 Stagecoach Reservoir Fill and Release Policies document. This involved:

- adjusting the reservoir account names, volumes, and fill priorities
- updating release volume limits based on current contracts
- adding new release rules to include new contract holders

Model Operation Considerations

StateMod is an appropriate planning tool to investigate the benefits and risks of increasing releases from Elkhead Reservoir and Stagecoach Reservoir to consumptive and non-consumptive uses. The following should be considered when evaluating the model output.

- StateMod allocates water based on strict prior appropriate. This does not account for historical "good neighbor" practices common in the basin, such as coordinating between water users to share the available supply instead of placing a call. Additionally, the Yampa Basin has only rarely experienced basin-wide administration. Water users and water commissioners are gaining experience administering the river, but do not have the "all-knowing" view of the river that the model has.

- StateMod does not operate based on forecasts, instead it has "perfect knowledge" of actual natural flow as an input to the model. This means that if forecasted conditions were inaccurate due to change in timing of runoff or irrigation season precipitation, the model may not predict the same flow requirements as was projected for the Recovery Program.
- StateMod does not have the ability to make decisions that are not strictly rule-based. Specifically for this effort, the Recovery Program staff manages Elkhead Reservoir releases to supplement streamflow in the Lower Yampa Critical Habitat Reach considering the anticipated conditions from July and October. Therefore, they may choose to hold back water in July to preserve water in storage for use in September. In addition, reservoir operators often make real-time decision to release water to avoid spills or to prevent icing damage. Although StateMod can be "hard-wired" to deviate from normal operations based on human decisions, consistent operating rules were adhered to for each scenario to provide a sound basis for comparison.
- StateMod does not consider travel time. Water that is released from a reservoir is instantly available at the destination. This is generally a reasonable assumption for the monthly time step but may be a simplification for the daily time step. For planning purposes, this simplification is sufficient. However, StateMod generally should not be used as an operational model.

Model Scenarios

StateMod is appropriately used for comparative analyses, meaning that the results from the alternative scenarios should be compared back to the Baseline scenario to see how a change in model assumptions causes changes in the model results. Based on input from the funders, two model scenario alternatives were developed to compare to the Baseline scenario.

- Alternative 2
- Alternative 3

The report starts with "Alternative 2" (instead of 1) to be consistent with the "Alternative 2" developed for the BIP Update.

Baseline

The Baseline scenario is designed to be the starting point for planning. The Baseline scenario represents current consumptive demands, current instream flow and recreational in-channel diversions (RICDs), existing infrastructure, and current reservoir operations. This current information is then superimposed on historical climate and hydrology. The goal of the Baseline scenario is to show the impacts of current water practices over a variety of hydrological conditions. This enables planners to understand physical and legal constraints on the system. The Baseline scenario is discussed in detail in the CDSS Yampa Water Resources Allocation Model and Phase 3 Model documentation previously referenced. As discussed in the Approach section, minor enhancements were made to the Phase 3 Model including extending the period of record, refining natural flows, incorporating transit losses, updating Stagecoach Reservoir operations, and revising representation of the Recovery Program.

Note that the historical Stagecoach Reservoir releases for the Colorado Water Trust are not included in the model. The funders discussed including a representation of these operations, but determined that the decision to release in order to alleviate stream temperature issues are made on a case-by-case basis and it would be beyond the scope of this effort to develop an analogue in StateMod.

Alternative 2 - New Releases from Existing Reservoirs

This scenario focuses on supplying supplemental water from Elkhead Reservoir and Stagecoach Reservoir to agricultural users and the Lower Yampa Critical Habitat Reach. A total of 14,908 acre-feet of additional storage capacity was made available to supplement flows in the Lower Yampa Reach for the Recovery Program and 2,457 acre-feet of storage capacity was made available to consumptive users in the reach. Note that this alternative is similar to the "Alternative 2" concept explored in the BIP Update; however no changes were made to the City of Steamboat demands or operations.

Elkhead Reservoir

Elkhead Reservoir stores water for the City of Craig, Tri-State for use at Craig Station, the Colorado River Water Conservation District (River District), and for the Recovery Program. Currently, the City of Craig, Tri-State, and the River District use water from storage infrequently. Alternative 2 explored how shortages could be improved by increasing releases from Elkhead Reservoir.

The River District's 2,457 acre-foot pool is made available to meet shortages to ditches downstream of Elkhead Reservoir. The maximum release rate from the River District pool was set to 25 cfs. This restriction prevents the pool from being completely emptied in the first month with irrigation season shortages.

In addition to the CWCB and Fish Lease pools, Tri-State's pools are also made available to the Recovery Program. Elkhead Reservoir releases to the Lower Yampa Reach from pools in the following order:

1. CWCB: This pool is the primary pool used by the Recovery Program to supplement flows. It has a capacity of 5,000 acre-feet.
2. Fish-Lease: The Recovery Program has the first right of refusal to lease an additional 2,000 acre-feet from the River District.
3. Tri-State 2: Tri-State has a 2,500 acre-foot pool in the enlargement of Elkhead Reservoir.
4. Tri-State 1: Tri-State has an 8,408 acre-foot pool in the original Elkhead Reservoir capacity.

The release limit to the Lower Yampa Reach was increased from 50 cfs to 75 cfs. The original Yampa Management Plan contemplated a maximum of 50 cfs in order to preserve the CWCB pool throughout the entire season (July through October). The Recovery Program did not want to quickly release their stored water at the beginning of July and have no water left in October. The Recovery Program and engaged stakeholders have gained experience in operating the supplemental reservoir releases and are comfortable increasing releases above 50 cfs for short periods of time to address critically low streamflow conditions, and the project funders felt it was appropriate to explore an increased maximum release limit. This modeled release limit does not impact releases to other users. For example, if Craig Station calls for 10 cfs, the City of Craig calls for 5 cfs, and the Recovery Program calls for the full 75 cfs, the reservoir would release 90 cfs

Note that downstream water users on Elkhead Creek are provided notice when the reservoir operators change reservoir release rates. Rate changes are currently communicated to downstream users to give them time to make headgate adjustments, move temporary fencing, and relocate their cattle. As concerns have been raised about stream erosion, Trout Unlimited is working with local landowners on a collaborate project to improve streambank stability.

As with current operations, if Craig Station demand is unable to be met by direct diversions from the river, they can still access their accounts in Elkhead Reservoir without imposition of a maximum release limit. There are no changes to the operations for the City of Craig, which can access their 4,413 acre-foot pool in the original Elkhead Reservoir capacity without imposition of a maximum release limit. The City of Craig pool does not release to the Lower Yampa Reach.

Table 4 summarizes the accounts, volumes, and users in Elkhead Reservoir. The accounts are listed in the order that they release to the Lower Yampa Reach to supplement the flow targets.

Table 4: Elkhead Accounts and Uses, Listed in Order of Release to Lower Yampa Reach

Account	Volume (acre-feet)	Destination
CWCB	5,000	Lower Yampa Reach
Fish Lease	2,000	Lower Yampa Reach
TriState 2	2,500	Craig Station, Lower Yampa Reach
TriState 1	8,408	Craig Station, Lower Yampa Reach
River District*	2,457	Agricultural Demands
City of Craig*	4,413	City of Craig

* Does not release to the Lower Yampa Reach

Stagecoach Reservoir

Stagecoach Reservoir is operated by UYWCD for water supply and recreation. The reservoir is operated to meet FERC minimum flow requirement downstream of the reservoir by bypassing up to 40 cfs of inflow, if possible. For the months of August, September, October, and November, bypassing inflow or releasing from the Preferred Remainder and then the Emergency Remainder pools up to 20 cfs. The reservoir releases supplemental supply to current contract holders, up to their annual contract amount.

Under Alternative 2, releases from Stagecoach Reservoir to the Lower Yampa Reach are included. After releasing to current contract holders, Stagecoach Reservoir supplements the Lower Yampa Reach flow target by releasing up to 100 cfs from the General Supply Pool. The General Supply Pool has a volume of 4,000 acre-feet. Releases from Elkhead Reservoir are made prior to releases from Stagecoach Reservoir.

Alternative 3 - Elkhead Release to Recovery Program Increased to 100 cfs

Alternative 3 builds on Alternative 2 by increasing the Elkhead Reservoir release limit to the Lower Yampa Reach to 100 cfs.

Results

This section presents a summary of results and comparison of the two scenarios to Baseline conditions.

Baseline Scenario Results Compared to Historical

The Baseline Scenario is used by the State as both the starting point and comparison point for "what-if" scenarios like Alternatives 2 and 3. The StateMod historical calibration model uses historical diversions for agricultural demands, whereas the Baseline Model sets agricultural headgate demands to meet the full crop irrigation requirement based on historical irrigation season weather, driven primarily by temperature and rainfall. As documented in the Yampa Water Resources Model User's Manual referenced above, the Baseline demand is generally higher than historical diversions and the resulting modeled diversions may be higher or lower than historical diversions. This approach to using full demands based on crop requirements allows irrigators to put their full water rights to beneficial use when water is available, regardless of how they irrigated in the past.

Figure 1 shows the total annual agricultural consumptive use shortage for all irrigated acres in the Yampa Basin. The historical model delivers water to the crops based on the historically observed diversions from the river. This results in larger consumptive use shortages than in Baseline, and by extension, Alternative 2 and Alternative 3. The average annual consumptive use shortage from 1975 through 2020 in the historical model is about 41,000 acre-feet and about 12,000 acre-feet for the Baseline scenario. This represents an average annual percent short of 13 percent for historical and 4 percent for Baseline.

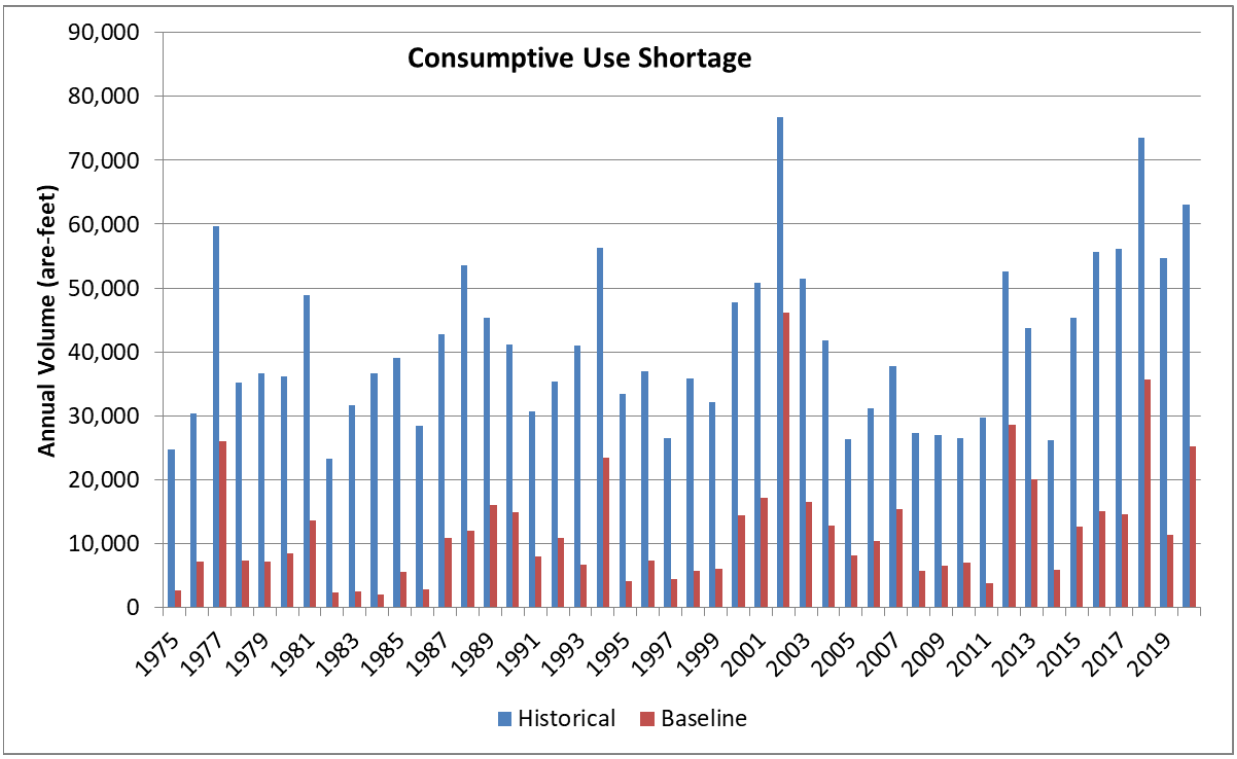


Figure 1: Annual Total Agricultural Consumptive Use Shortage for All Irrigated Acres in the Yampa Basin

StateMod allocated water based on full crop irrigation demand, water rights, and legally available streamflow. Often simulated diversions are greater than historical diversion and the Baseline model shows less shortages than historical.

- StateMod cannot represent the time required to dry out fields before harvesting. In the Yampa, the primary crop type is grass pasture, followed by alfalfa. These crops account for over 99 percent of the irrigated crops. Before these crops can be cut and baled, the field must be dried out. The model does not represent these periods of no irrigation. Instead, the model diverts water whenever there is crop irrigation requirement.
- StateMod does not represent the common practices of not fully irrigating after the last cutting of the season.
- StateMod does not consider low-flow infrastructure constraints or the inability to divert below a streamflow threshold. In practice, it might not be practical or possible for all of the diversion structures to divert at very low streamflow levels; however StateMod can simulate diversions until the physical flow in the river is zero.

The simulated increase in consumptive use during certain periods results in less streamflow in the model than historical conditions. For example, the Baseline scenario has three percent to ten percent less annual streamflow volume than observed at the Yampa River near Deerlodge gage. For the purposes of this project, it is useful to consider lower streamflow levels than historical conditions, as climate change projections point towards a warmer, drier future.

Figure 2 compares the monthly streamflow volume at the Yampa River near Deerlodge gage location. The blue line is the volume observed at the USGS gage. The red line is the Baseline model simulated streamflow. The tables show the change in monthly volume for the months of July through October for 2017 through 2020. The black dashed line shows the Recovery Program streamflow targets as a monthly volume. As shown in Table 2, the Recovery Program volume varies depending on the hydrologic year type.

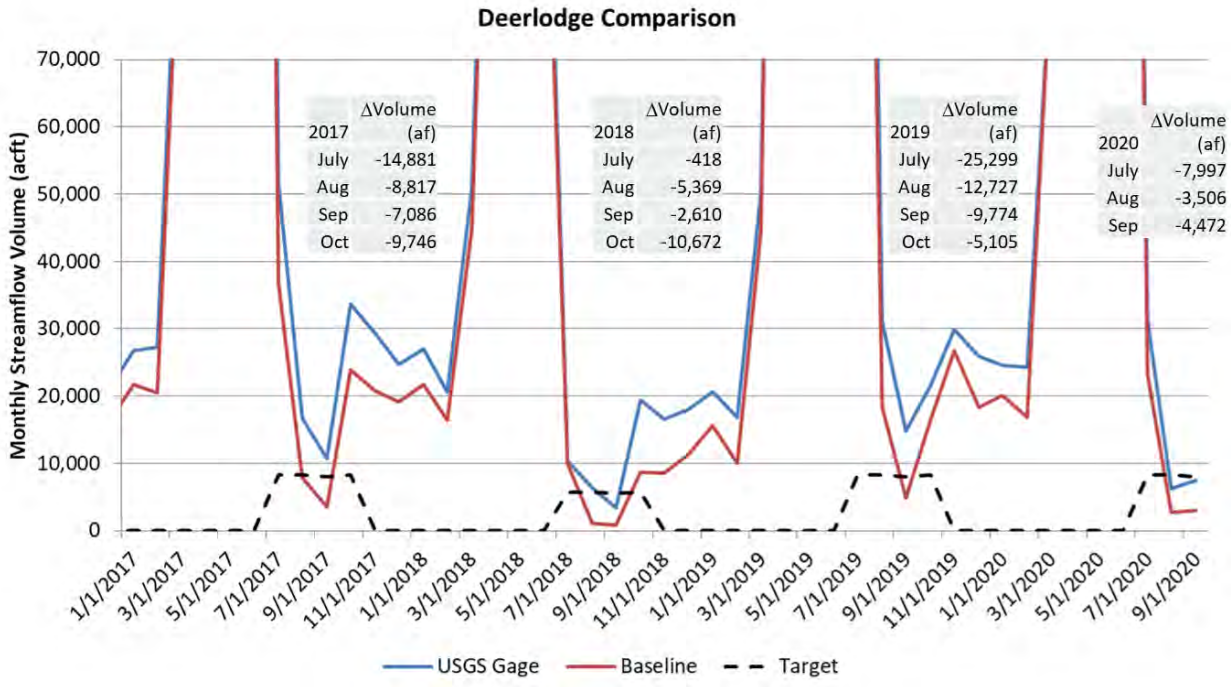


Figure 2: Yampa River at Deerlodge Monthly Streamflow Volume Comparison

The key observation from Figure 2 is that the Baseline scenario will show more shortages to the Recovery Program streamflow targets than historical conditions because of the increased agricultural consumptive use.

Baseline and Scenario Comparisons

The following section compares results from the Baseline, Alternative 2 and 3. Results are presented for:

- Agricultural uses
- Municipal and Industrial users
- Recovery Program streamflow targets
- Elkhead and Stagecoach reservoir storage

Agricultural Uses

In Alternative 2 and 3, Elkhead Reservoir releases from the River District pool to agricultural uses located downstream of Elkhead Creek at a maximum rate of 25 cfs. These releases help to reduce the consumptive use shortages for the agricultural uses both in the reach and upstream of Elkhead Creek.

The impacts ripple upstream as return flows generated from the reservoir releases increase the water supply, and the call on the river is lifted.

Table 5 presents the average annual headgate demand, average annual headgate gap, average annual percent gap at the headgate, and average annual consumptive use gap by region for the Yampa Basin. Values are calculated from water year 1975 through 2020. The Middle Mainstem region extends from Stagecoach Reservoir to the confluence with Elkhead Creek and only considers structures that divert directly from the Yampa River. The Lower Mainstem region extends from the confluence with Elkhead Creek to the confluence with the Green River. The Other Tributaries region includes structures located on Morrison Creek, Service Creek, Green Greek, Harrison Creek, Oak Creek, Walton Creek, Soda Creek, Trout Creek, Elkhead Creek, Fortification Creek, and Milk Creek.

Table 5: Yampa Basin Average Agricultural Results by Region (1975 - 2020), acre-feet per year

Yampa Basin Agricultural Gap Results by Region (Period Avg)

Tributary	Average Annual Demand	Average Annual Gap	Average Annual Percent Gap	Average Annual CU Gap
Baseline				
Above Stagecoach	73,815	1,232	2%	670
Elk River	51,196	997	2%	542
Williams Fork	47,011	3,431	7%	1,853
Middle Mainstem	71,631	60	0%	32
Lower Mainstem	88,556	526	1%	297
Little Snake River	112,552	6,011	5%	3,350
Other Tribs	93,579	8,741	9%	4,975
Alternative 2				
Above Stagecoach	73,815	1,211	2%	659
Elk River	51,196	970	2%	528
Williams Fork	47,011	3,416	7%	1,845
Middle Mainstem	71,631	52	0%	28
Lower Mainstem	88,556	311	0%	175
Little Snake River	112,552	5,990	5%	3,338
Other Tribs	93,579	8,660	9%	4,930
Alternative 3				
Above Stagecoach	73,815	1,219	2%	663
Elk River	51,196	977	2%	531
Williams Fork	47,011	3,418	7%	1,846
Middle Mainstem	71,631	56	0%	30
Lower Mainstem	88,556	317	0%	179
Little Snake River	112,552	5,991	5%	3,338
Other Tribs	93,579	8,685	9%	4,944

Key observations from the table include the following:

- Agricultural demands are spread across the basin. Every region contributes to the overall basin demands.
- Headgate gaps and CU gaps are generally small.
- The region with the largest volume of gap and largest percent gap is “Other Tributaries”. The smaller tributaries to the Yampa Basin can have insufficient physical supply even if there is no call on the river.
- On average, releases from Elkhead Reservoir to users in the Lower Mainstem region help reduce the gap, but do not completely eliminate shortages.
- The results for Alternative 2 and 3 are very similar. This is to be expected since representation of releases to agricultural users for the two scenarios is the same.

Table 6 presents the same information as Table 5 for 2018. This year was selected because it is a recent, dry year and shows more severe shortages to agricultural users.

Table 6: Yampa Basin Agricultural Results for 2018 by Region, acre-feet per year

Yampa Basin Agricultural Gap Results by Region (2018)

Tributary	Average Annual Demand	Average Annual Gap	Average Annual Percent Gap	Average Annual CU Gap
Baseline				
Above Stagecoach	79,201	7,040	9%	3,844
Elk River	56,199	3,897	7%	2,120
Williams Fork	48,233	8,566	18%	4,635
Middle Mainstem	87,021	305	0%	167
Lower Mainstem	89,085	5,316	6%	3,095
Little Snake River	99,973	18,842	19%	10,502
Other Tribs	99,691	21,688	22%	12,303
Alternative 2				
Above Stagecoach	79,201	6,973	9%	3,808
Elk River	56,199	3,724	7%	2,026
Williams Fork	48,233	8,353	17%	4,516
Middle Mainstem	87,021	243	0%	132
Lower Mainstem	89,085	3,577	4%	2,071
Little Snake River	99,973	18,842	19%	10,502
Other Tribs	99,691	21,384	21%	12,135
Alternative 3				
Above Stagecoach	79,201	6,983	9%	3,813
Elk River	56,199	3,734	7%	2,031
Williams Fork	48,233	8,363	17%	4,521
Middle Mainstem	87,021	246	0%	134
Lower Mainstem	89,085	3,632	4%	2,104
Little Snake River	99,973	18,842	19%	10,502
Other Tribs	99,691	21,569	22%	12,238

Key observations from the table include the following:

- Compared to the average annual demands, the demands in 2018 tend to be larger. This reflects the higher temperatures and lower precipitation experienced in 2018.
- Agricultural users experience a larger headgate gap, both in terms of volume and as a percent of demand. This reflects the dry conditions in 2018.
- Gaps are not uniformly distributed over the basin. The areas that experience the larger gaps on average also experience a larger increase in gaps during dry years. In particular, the "Other Tributaries", "Little Snake River", and "Williams Fork" have higher shortages in a dry year.
- Alternatives 2 and 3 reduced agricultural gaps throughout the basin, except in the Little Snake. This is to be expected because the confluence with the Little Snake is downstream of the

agricultural users benefitting from storage releases and users on the Little Snake River do not benefit from increased return flows.

- The "Lower Mainstem" region has the biggest reduction in gap because the agricultural users in this region are directly receiving water from the River District's account in Elkhead Reservoir.
- The results from Alternatives 2 and 3 are very similar.

To illustrate the changes throughout the basin, Figure 3 through Figure 5 show maps of the agricultural diversions in the Yampa River Basin in 2018. Figure 3 is an overview map of the entire basin. The structures are color-coded by the percent change in consumptive use shortage from Baseline to Alternative 2. A value of "-100%" indicates that the CU shortage in the Baseline model is fully met in Alternative 2. The overview map shows that the majority of structures that have a change in consumptive use shortage are located in the Lower Yampa region (downstream of Elkhead Reservoir). However, there are structures throughout the basin that have reduced shortages. As discussed above, this is caused by the increase in available flow to the downstream users, allowing the upstream users to divert and consume physically available water. There are a few structures that have an increase in consumptive use shortage. This is caused by Elkhead Reservoir needing to store more water to refill the reservoir in Alternative 2 than in Baseline due to the increased releases - both to agricultural users and the Lower Yampa Reach streamflow target.

Figure 4 and Figure 5 show portions of the Lower Yampa region. The structures are labeled with the total annual consumptive use shortage from Baseline and (*Alternative 2*). Notice that the Lily Park structures located at the bottom of the reach do not have any shortage in the Baseline model. This is because these structures hold senior water rights that call out upstream users so that their demands are fully met.

Figure 6, Figure 7, and Figure 8 show the same series of maps for 2020 – another representative dry year. The results are very similar, but show variation from 2018, due to variations in physical water availability between the two years.

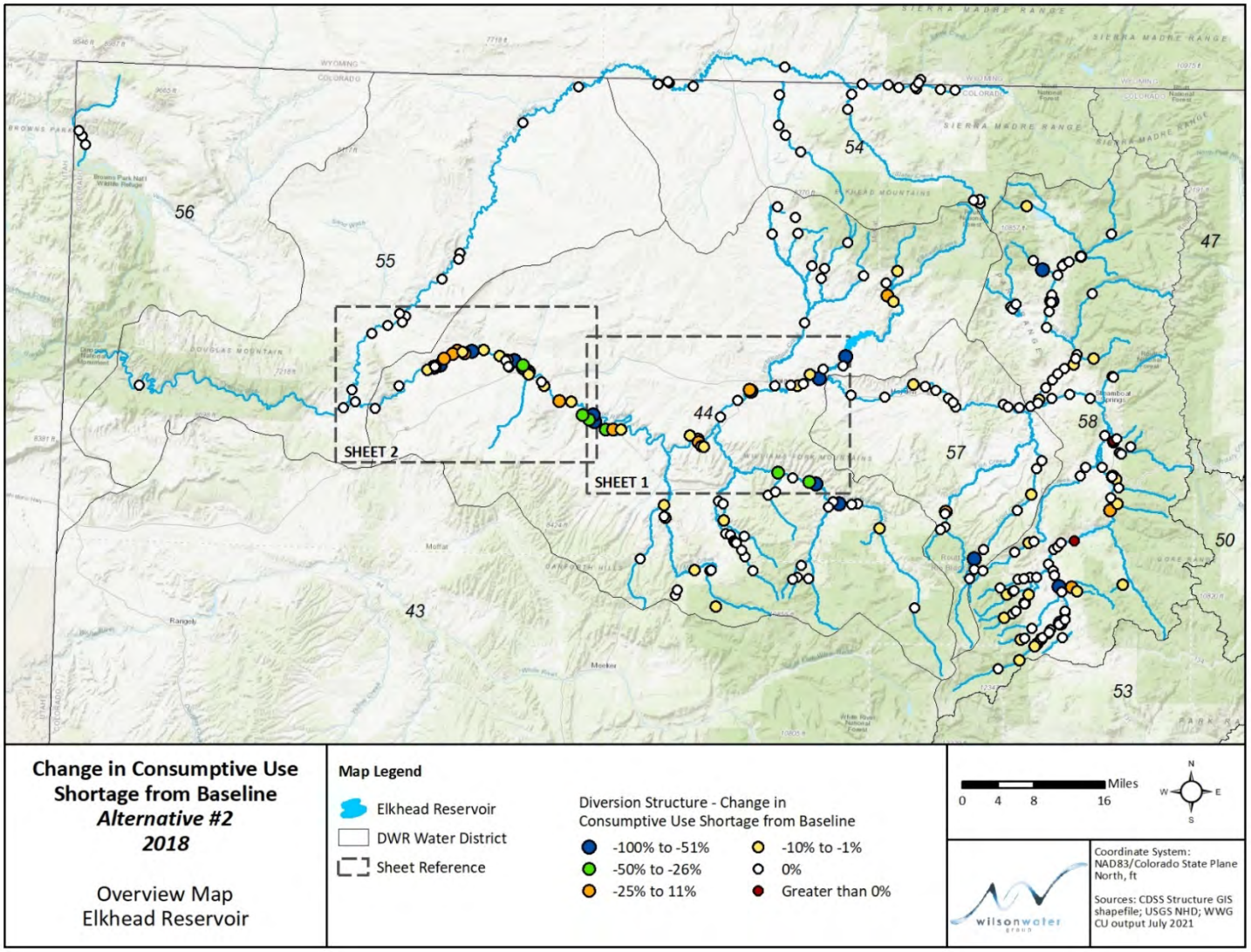


Figure 3: Overview Map of Change in Consumptive Use Shortage from Baseline to Alternative 2 (2018)

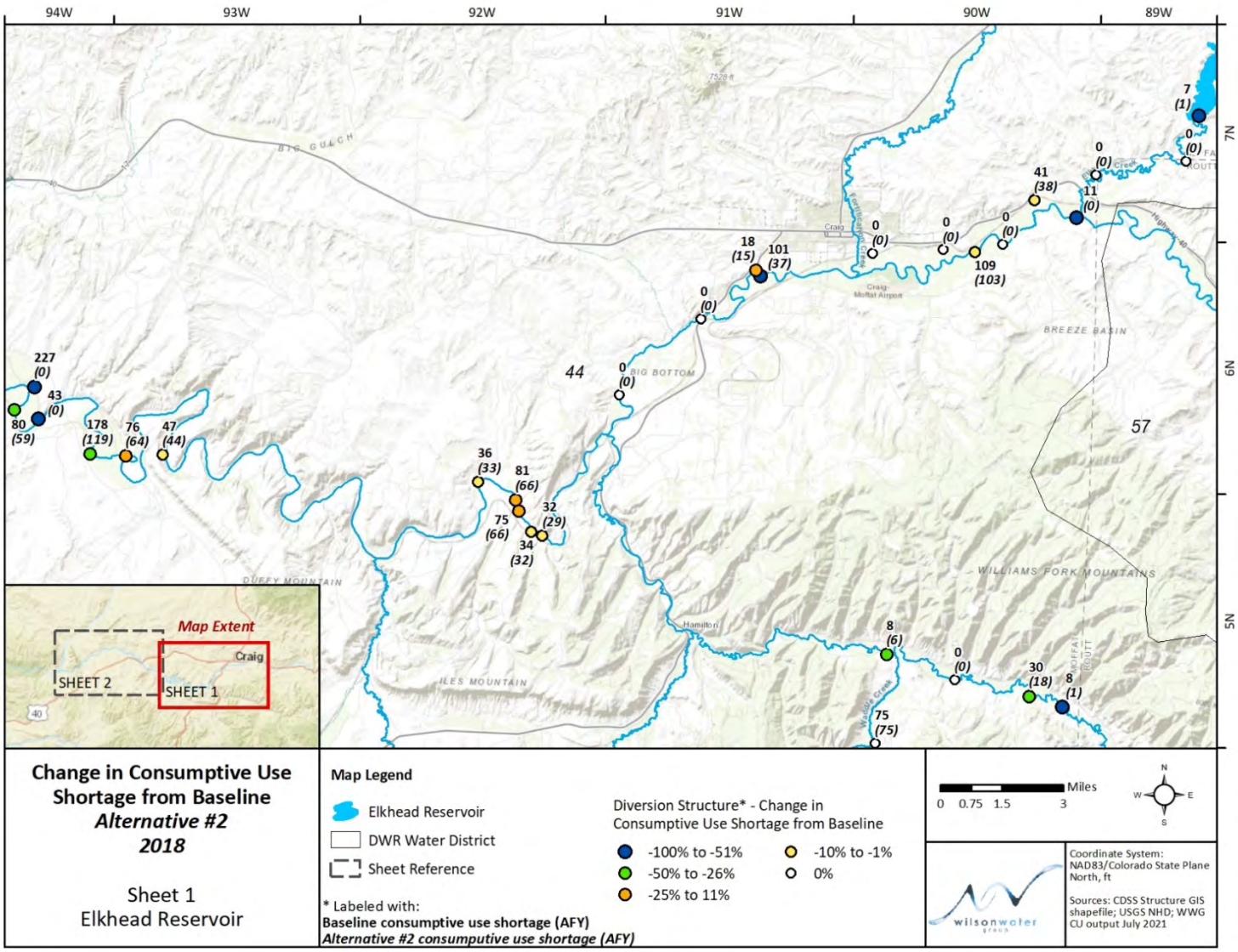


Figure 4: Sheet 1 - Map of Change in Consumptive Use Shortage from Baseline to Alternative 2 (2018)

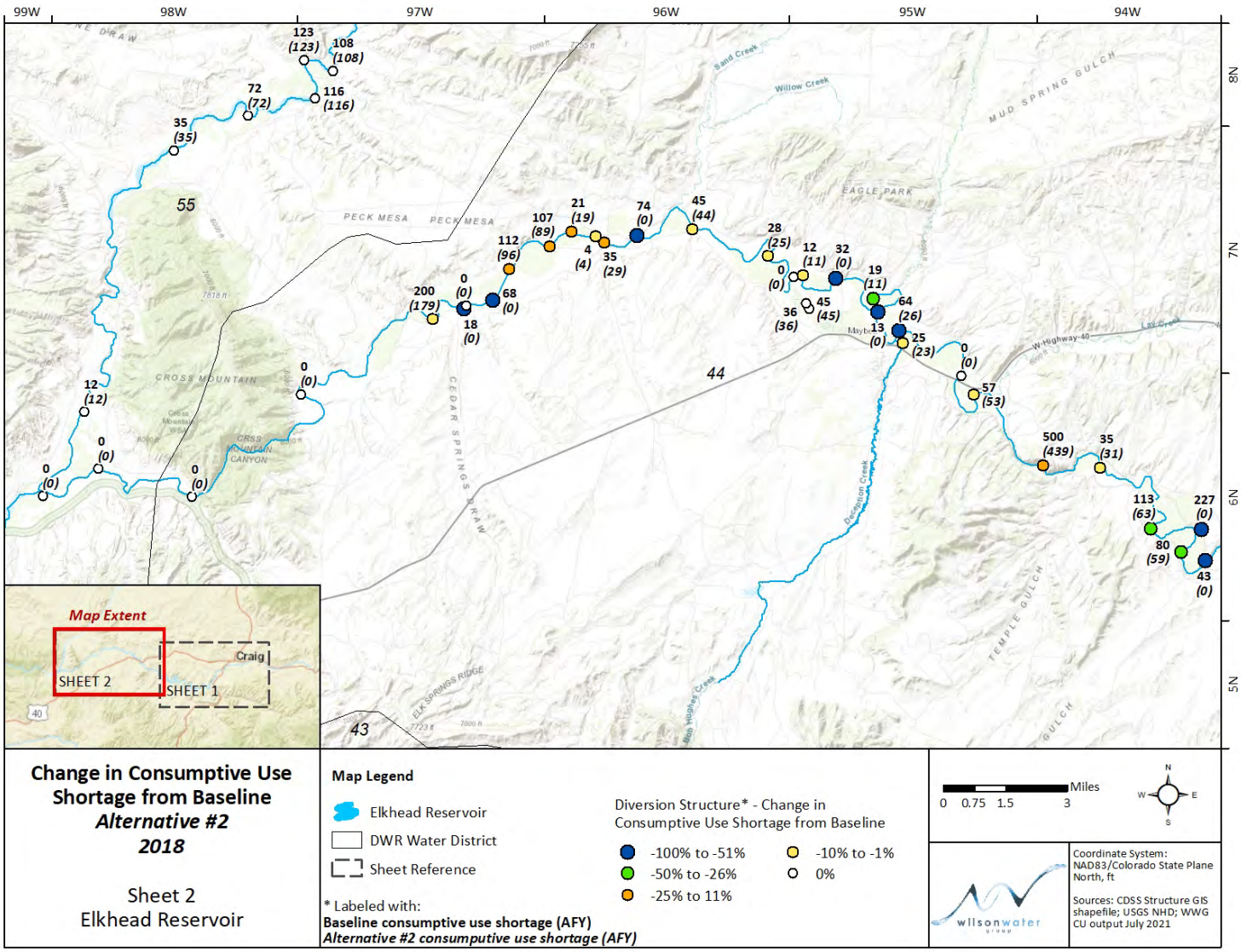


Figure 5: Sheet 2 - Map of Change in Consumptive Use Shortage from Baseline to Alternative 2 (2018)

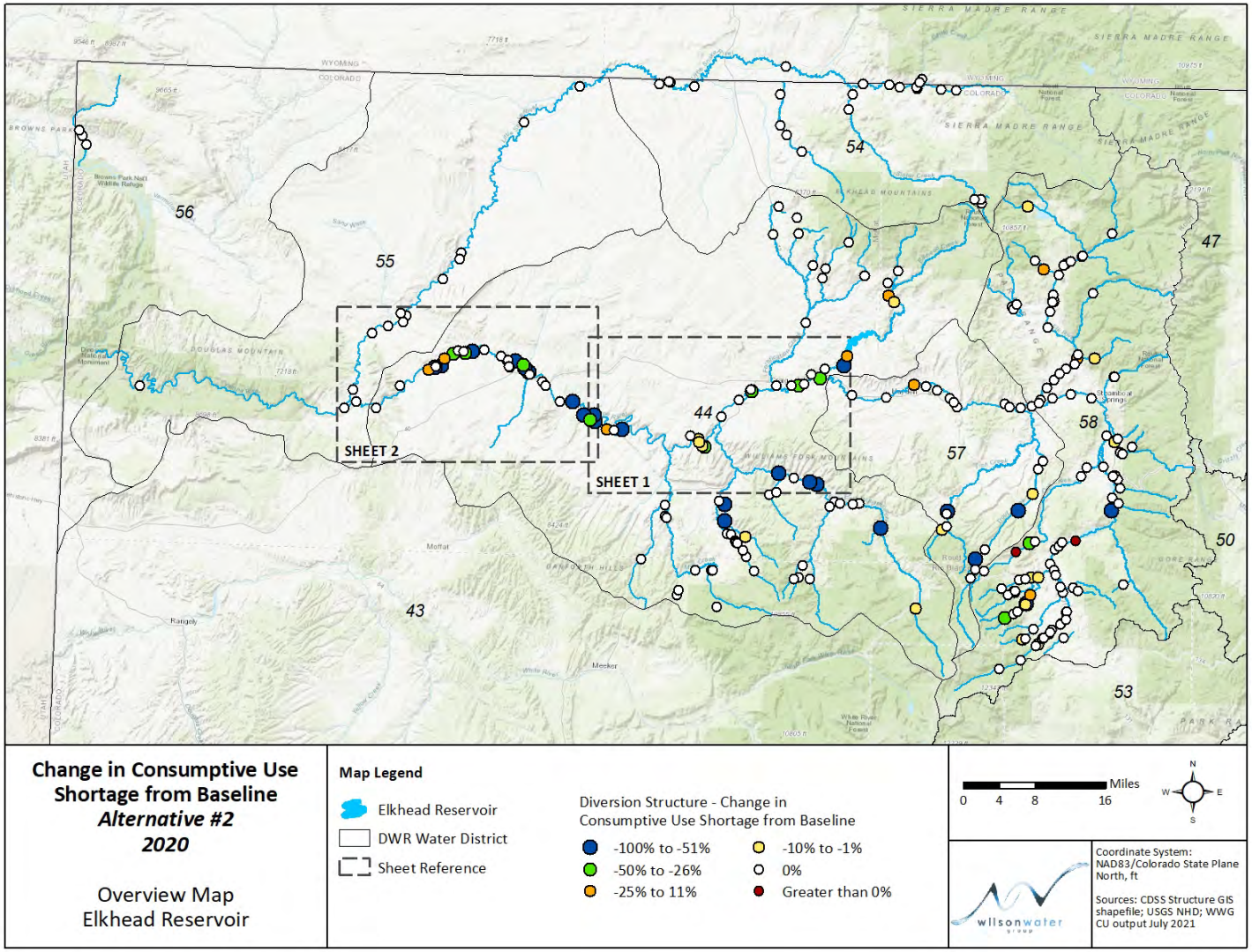


Figure 6: Overview Map of Change in Consumptive Use Shortage from Baseline to Alternative 2 (2020)

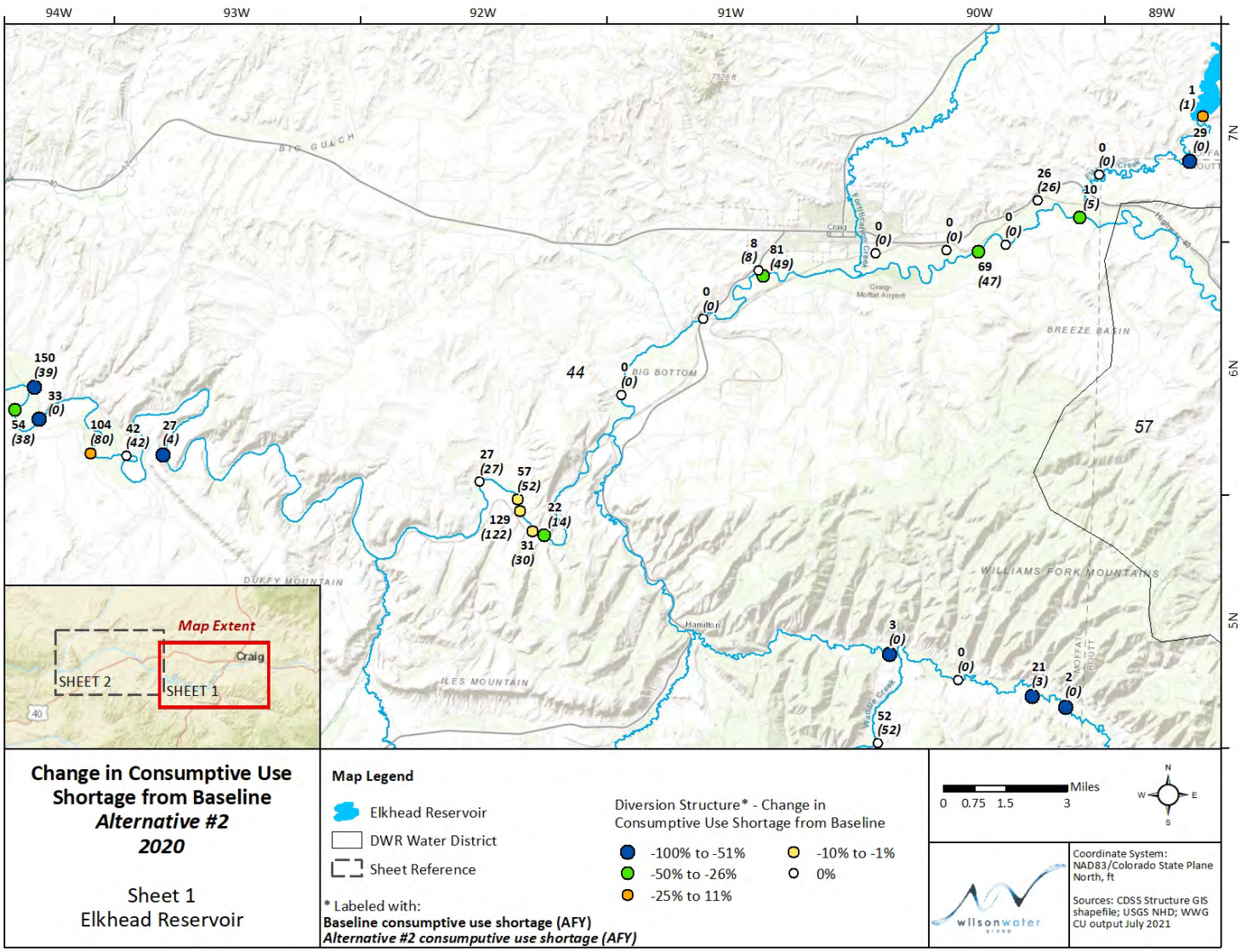


Figure 7: Sheet 1 - Map of Change in Consumptive Use Shortage from Baseline to Alternative 2 (2020)

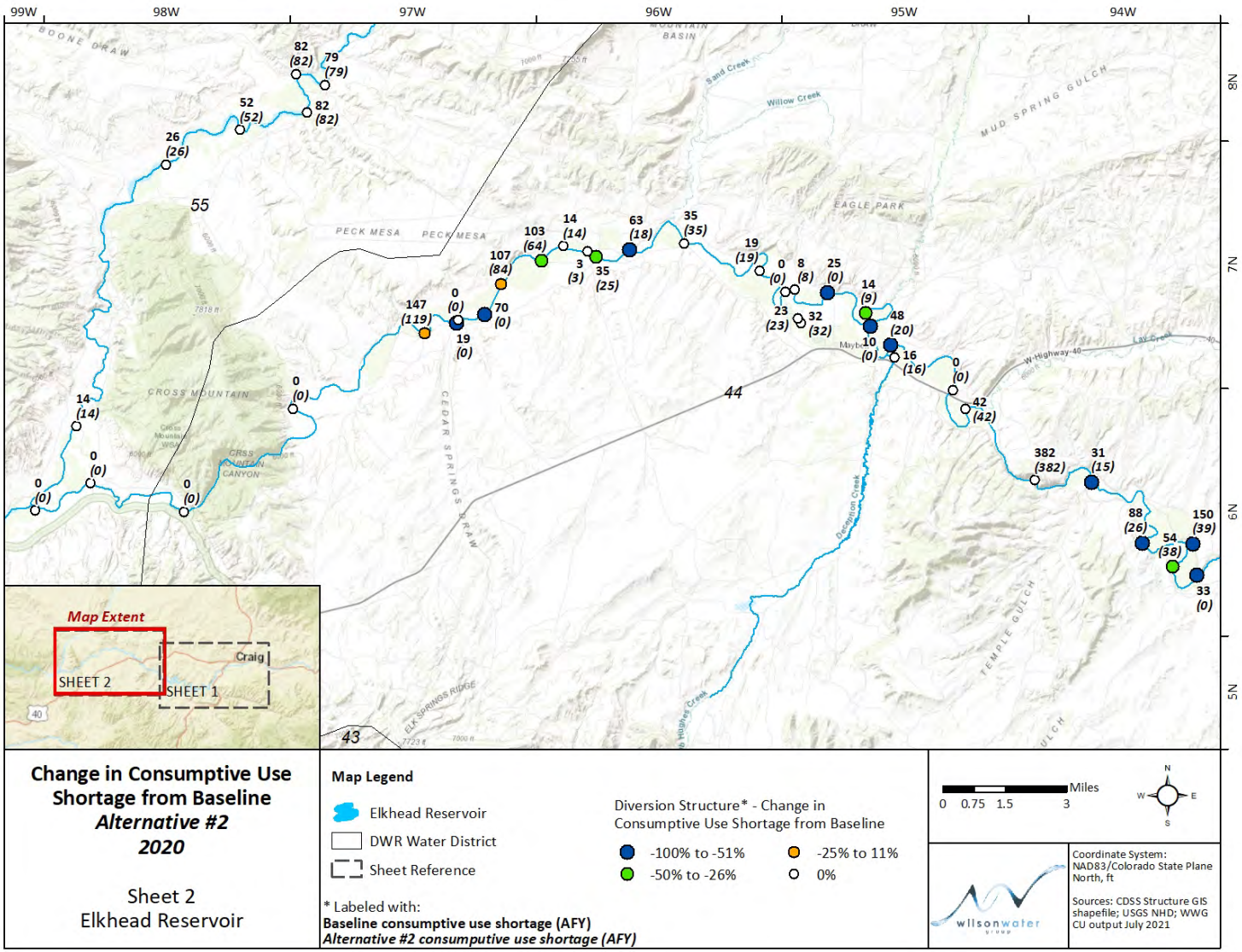


Figure 8: Sheet 2 - Map of Change in Consumptive Use Shortage from Baseline to Alternative 2 (2020)

Figure 9 shows a time series of Elkhead releases to agricultural users and any remaining gaps by those same users for Alternative 2. The graph focuses on 2000 through 2020, to highlight recent droughts. The releases are sufficient to close the agricultural gaps except for the very dry years of 2002, 2012, 2018, and 2020. In particular, 2018 still has substantial consumptive use shortages.

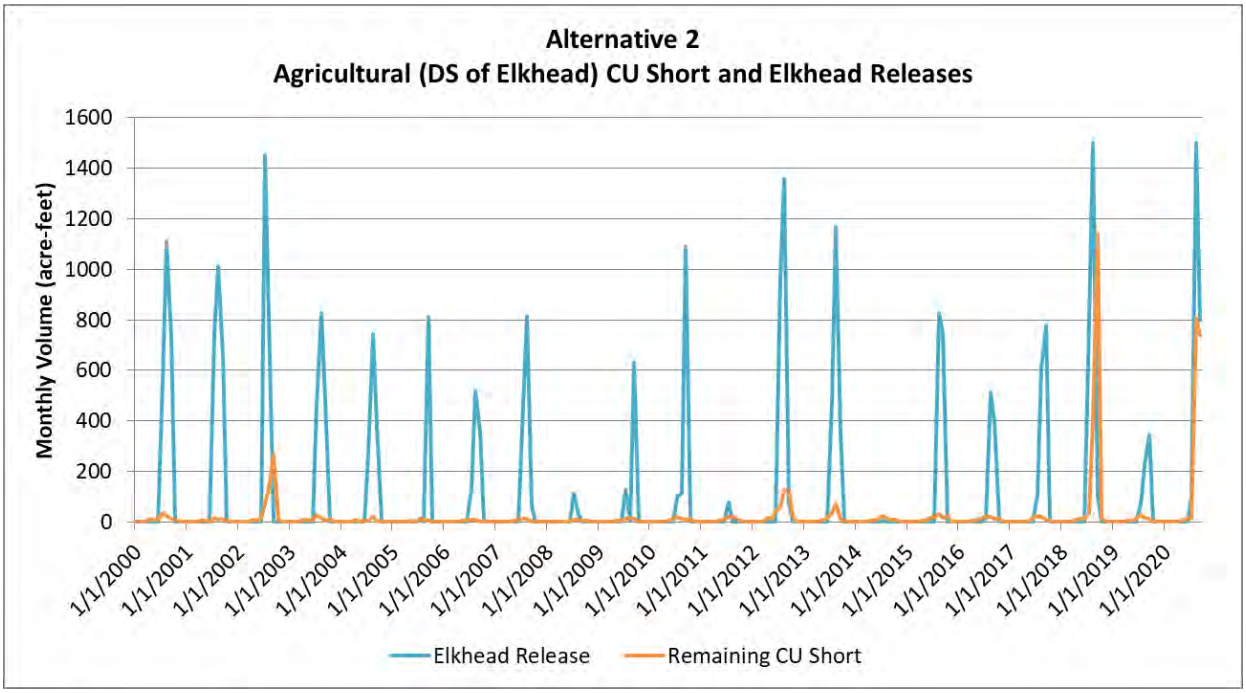


Figure 9: Alternative 2 monthly Elkhead releases to agricultural users and remaining CU short

Table 7 shows the total annual releases from Elkhead Reservoir to agricultural users for Alternatives 2 and 3. As mentioned above, the values are very similar for the two Alternatives. The median annual release is about 1,000 acre-feet. The releases reduced agricultural shortages to downstream users on average by about 80 percent. In dry years, shortages are reduced on average by about 95 percent.

Table 7: Agricultural Shortages and Alternative 2 and 3 Annual Elkhead Releases to Agricultural Users

	Annual Elkhead Releases (af)	
Year	**Alternative 2**	**Alternative 3**
2000	2,400	2,401
2001	2,407	2,401
2002	2,096	1,503
2003	1,773	1,782
2004	1,402	1,409
2005	824	831
2006	1,008	1,015
2007	1,340	1,341
2008	144	144
2009	765	774
2010	1,309	1,301
2011	76	76
2012	2,397	2,398
2013	1,997	2,008
2014	7	7
2015	1,568	1,613
2016	921	925
2017	1,497	1,536
2018	2,398	2,396
2019	639	651
2020	2,404	2,404
Min (1975-2020)	*7*	*7*
Median (1975-2020)	*1,072*	*1,076*
Max (1975-2020)	*2,703*	*2,702*
Year of Max	*1979*	*1979*

Municipal and Industrial Users

The City of Craig is represented in the StateMod model. The City has direct flow rights and 4,413 acre-feet of storage in Elkhead Reservoir. The demands are the average of a recent ten year period. The direct diversion rights are sufficient to meet the City's current demands. The model never released from Elkhead Reservoir to the City of Craig.

Craig Station is represented in a simplified fashion in the StateMod model. The Station has three units, which have different water right portfolios. The model combines both the demands and the water rights from the three units. In addition to the direct flow rights, Craig Station has two accounts in Elkhead Reservoir. The more senior account is referred to as "TriState 1", with a capacity of 8,408 acre-feet. This

account is located in the original Elkhead Reservoir. The more junior account is referred to as "TriState 2", with a capacity of 2,500 acre-feet. This account is located in the Elkhead Reservoir enlargement.

As shows in Table 8, the model frequently releases water to Craig Station. This allows Craig Station to fully meet its demand, except under Alternative 3. In September of 1977, 2002, and 2012, the TriState1 and TriState2 pools are exhausted due to the increased releases to the Recovery Program streamflow targets and there is insufficient water to release to the Craig Station demand. More details on the reservoir releases and accounts are provided in the following sections. The maximum daily release rate to Craig Station is 23 cfs, which occurs on multiple days throughout the model period.

Table 8: Annual Elkhead Release to Craig Station

	Annual Elkhead Releases (af)		
Year	**Baseline**	**Alternative 2**	**Alternative 3**
2000	2,005	1,838	1,829
2001	2,493	2,405	2,420
2002	3,930	3,916	3,094
2003	1,712	1,621	1,618
2004	828	790	797
2005	606	554	554
2006	522	387	386
2007	1,304	1,237	1,248
2008	0	0	0
2009	633	612	614
2010	994	972	972
2011	0	0	0
2012	2,917	2,892	2,607
2013	1,123	926	958
2014	0	0	0
2015	1,231	1,043	1,082
2016	1,015	870	828
2017	1,065	1,036	1,036
2018	3,119	3,108	3,108
2019	557	532	533
2020*	2,459	2,468	2,470
Min (1975-2020)	*0*	*0*	*0*
Median (1975-2020)	*683*	*645*	*647*
Max (1975-2020)	*3,930*	*3,916*	*3,108*
Year of Max	*2002*	*2002*	*2018*

* The modeled year 2020 does not include October.

Recovery Program Streamflow Targets

The following section presents results from Baseline, Alternative 2 and Alternative 3 for the Recovery Program Streamflow Targets. The results represent the lowest streamflow value simulated in the reach from the Maybell gage to the confluence with the Little Snake. In StateMod, releases from the reservoirs are protected through the reach.

Table 9 compares the percent of days in each month that the Recovery Program streamflow target is met. Note that, as discussed above, the Historical measured flows differ from the Baseline. For example, in the Historical simulation, 91 percent of the days in July meet the streamflow target whereas 80 percent of the days in July meet the streamflow target in the Baseline simulation.

Table 9: Percent of Days in Each Month that the Recovery Program Streamflow Target is Met

Percent of Days that Streamflow Target is Met

Scenario	July	August	September	October
Historical	91%	80%	58%	90%
Baseline	83%	59%	36%	83%
Alternative 2	100%	95%	80%	92%
Alternative 3	100%	99%	92%	95%

Key observations from the table are:

- The month of September has the fewest days that meet the stream flow target.
- In the Historical and Baseline scenarios, approximately 7,000 acre-feet of storage is available in Elkhead Reservoir with a 50 cfs release limit to supplement the Recovery Program streamflow targets. The Baseline scenario has fewer days that meet the streamflow target than the historical simulation. This is due to the higher consumptive use in the Baseline scenario, which results in lower streamflow.
- In Alternative 2, about 18,000 acre-feet of storage is available in Elkhead Reservoir with a 75 cfs release limit, plus 4,000 acre-feet of storage in Stagecoach with a 100 cfs release limit. Alternative 2 shows large improvements in the percent of days that meet the streamflow target compared to Baseline and better conditions than the Historical scenario. Increasing the available storage and release rate from Elkhead Reservoir while also providing water from Stagecoach Reservoir can make up for the lower streamflow caused by the increased consumptive use and improve conditions beyond what has been experienced historically.
- In Alternative 3, about 18,000 acre-feet of storage is available in Elkhead Reservoir with a 100 cfs release limit, plus 4,000 acre-feet of storage in Stagecoach with a 100 cfs release limit. Alternative 3 shows additional improvements over Alternative 2. This suggests that the release rate restriction on Elkhead Reservoir could limit the ability to meet the streamflow targets.

Figure 10 compares daily streamflow at the Yampa River near Maybell gage. The figure report the observed streamflow at the USGS gage and the simulate streamflow from the Baseline, Alternative 2 and Alternative 3 scenarios. The black dashed line shows the Recovery Program streamflow target estimated by StateMod. The scale in enlarged to highlight the low flows.

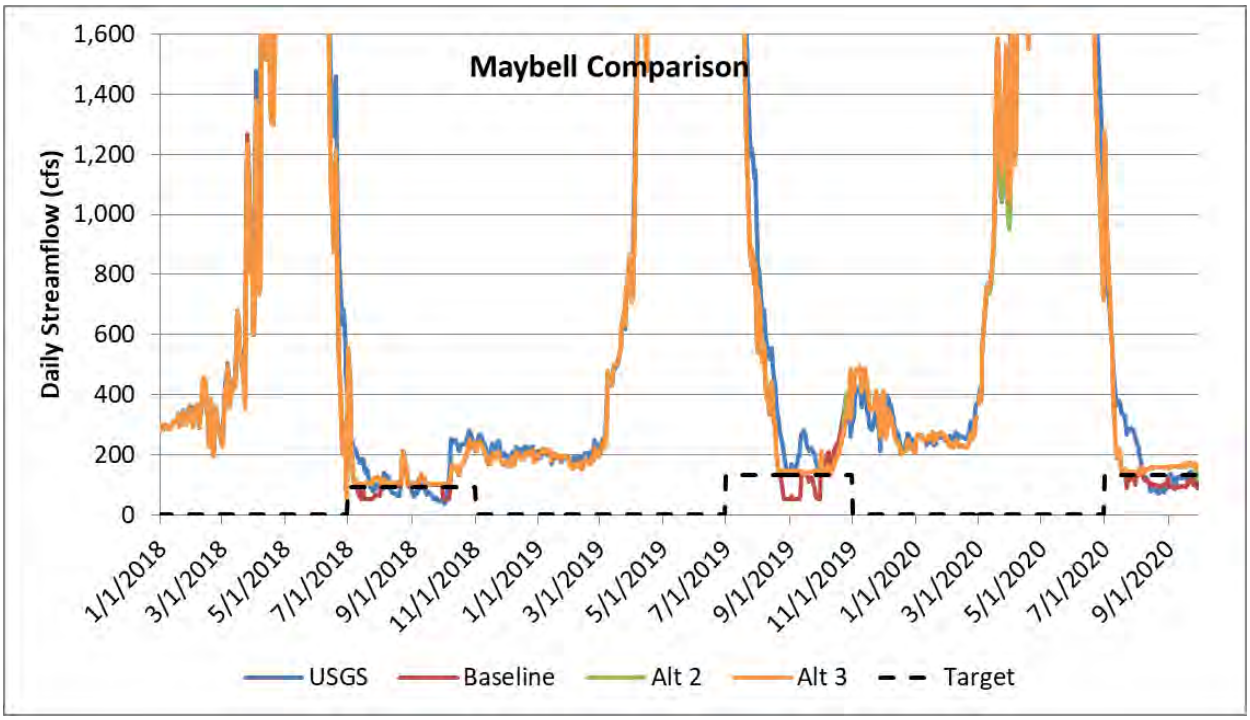


Figure 10: Yampa River Near Maybell Gage Streamflow Comparison (2018 - 2020)

In Figure 10, the differences at low flows are apparent. In 2019, the Baseline streamflow in September is limited to the 50 cfs release limit. The larger release limits combined with releases from Stagecoach Reservoir in Alternatives 2 and 3 allow the model to meet the streamflow target. In some years, it appears that the model may be over-releasing to meet the streamflow target. This is because the graph presents streamflow at the top of the reach. Native streamflow may be diverted by agricultural users within the reach and the model releases based on the lowest streamflow point in the reach.

In addition to impacts during the late irrigation season, the funders are interested in understanding impacts to peak flows, due to more water needing to be stored in order to refill the reservoirs. Table 10 presents statistics on the change in peak flow day between Baseline and Alternatives 2 and 3. The peak flow day for each year is compared across the scenarios. The maximum difference occurred in 2003 for Alternative 2 and 2013 for Alternative 3. The median is zero, which means that over half of the years had no change in the peak flow day. Note that in June 2021, the USGS published “Assessment of Streamflow and Water Quality in the Upper Yampa River Basin, Colorado, 1992-2018” (Scientific Investigations Report 2021-5016). For more details on peak flow in the Upper Yampa, please refer to this report.

Table 10: Change in Peak Flow at Yampa River Near Maybell

Statistic	Delta Peak Flow from Baseline to:	
	Alternative 2 (cfs)	Alternative 3 (cfs)
Max	189	139
Median	0	0
Average	10	5

Results from selected years are presented below showing the sources of water at the Yampa River Near Maybell location and the reservoir storage by account. The graphs illustrate the variability in native flow and how the model releases water to supplement streamflow. The model operates to meet the flow targets by first releasing water from the CWCB pool in Elkhead Reservoir, up to the release limit. If there is a shortage remaining, water is released from Stagecoach, up to the 100 cfs release limit. Once the CWCB pool is exhausted, the model releases from the Fish Lease pool, Tri-State's pool in the Elkhead enlargement (TriState2), and finally Tri-State's original pool (TriState1). When the reservoir supplies are exhausted, the graphs show black bars to represent shortages to the Recovery Program streamflow targets.

Figure 11 shows results from Alternative 2 in 2018, a dry year.

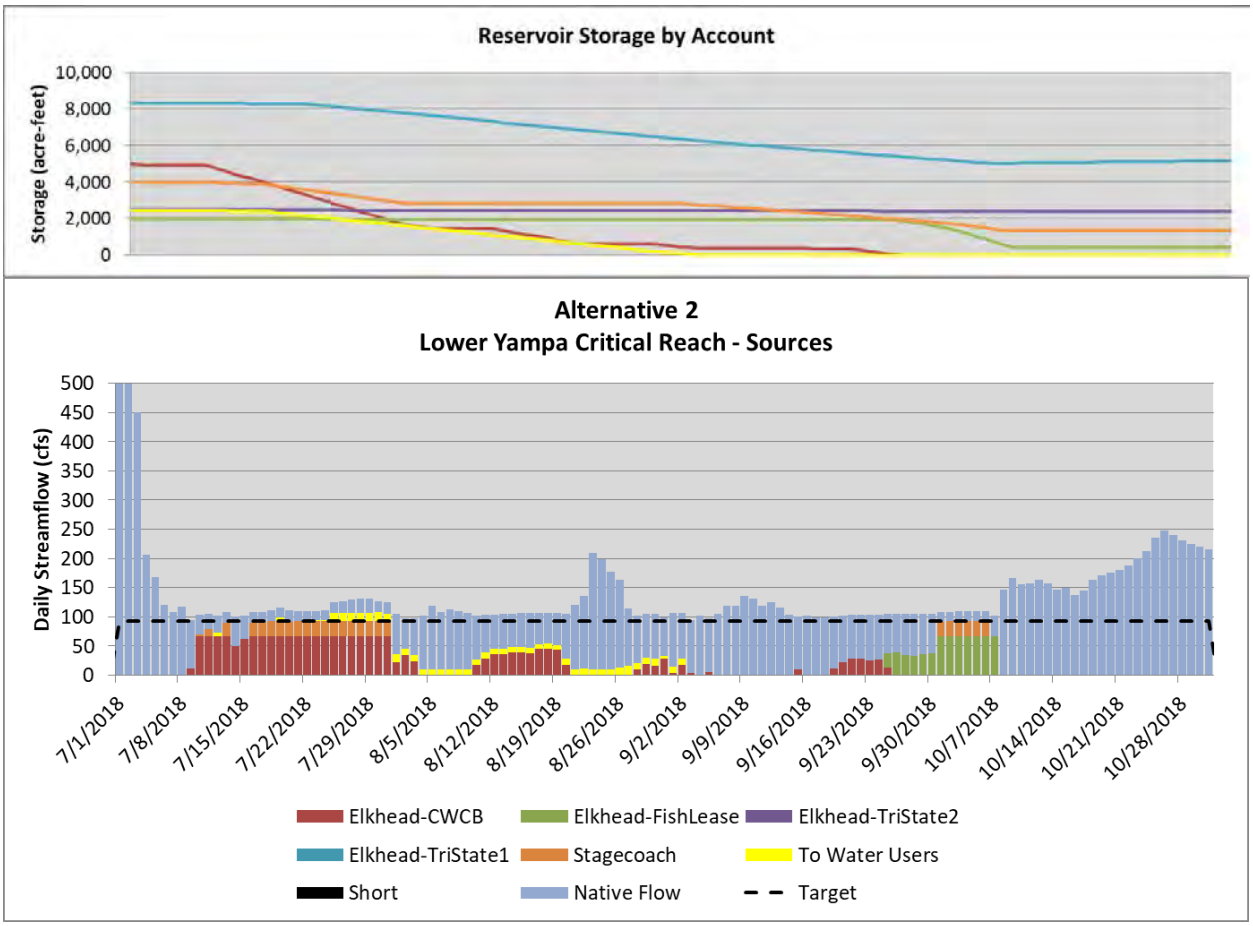


Figure 11: Alternative 2 - Lower Yampa Critical Reach Sources of Water and Reservoir Storage by Account (2018)

The streamflow target is 93 cfs. The native streamflow drops off sharply at the beginning of July and Elkhead Reservoir begins releasing water on July 9. In Alternative 2, releases are restricted to 75 cfs and for many days in July the release limit is reached. When the 75 cfs from Elkhead is not sufficient, additional water is released from Stagecoach Reservoir in order to meet the 93 cfs target. In late July, water is released to agricultural users in the reach and this water is seen at the Maybell gage, but then diverted by agricultural users within the reach. Native streamflow recovers slightly in August and September. The CWCB pool is exhausted and releases from the Fish Lease pool start at the end of September and carry into October. In early October, the release limit from Elkhead is reached and additional water from Stagecoach Reservoir is released. There are no shortages to the Recovery Program streamflow targets.

Notice that the Tri-State 1 Pool in Elkhead levels are declining despite not releasing to supplement the Recovery Program. The pool is releasing to Craig Station.

Figure 12 shows results from Alternative 2 in 2019, an average year.

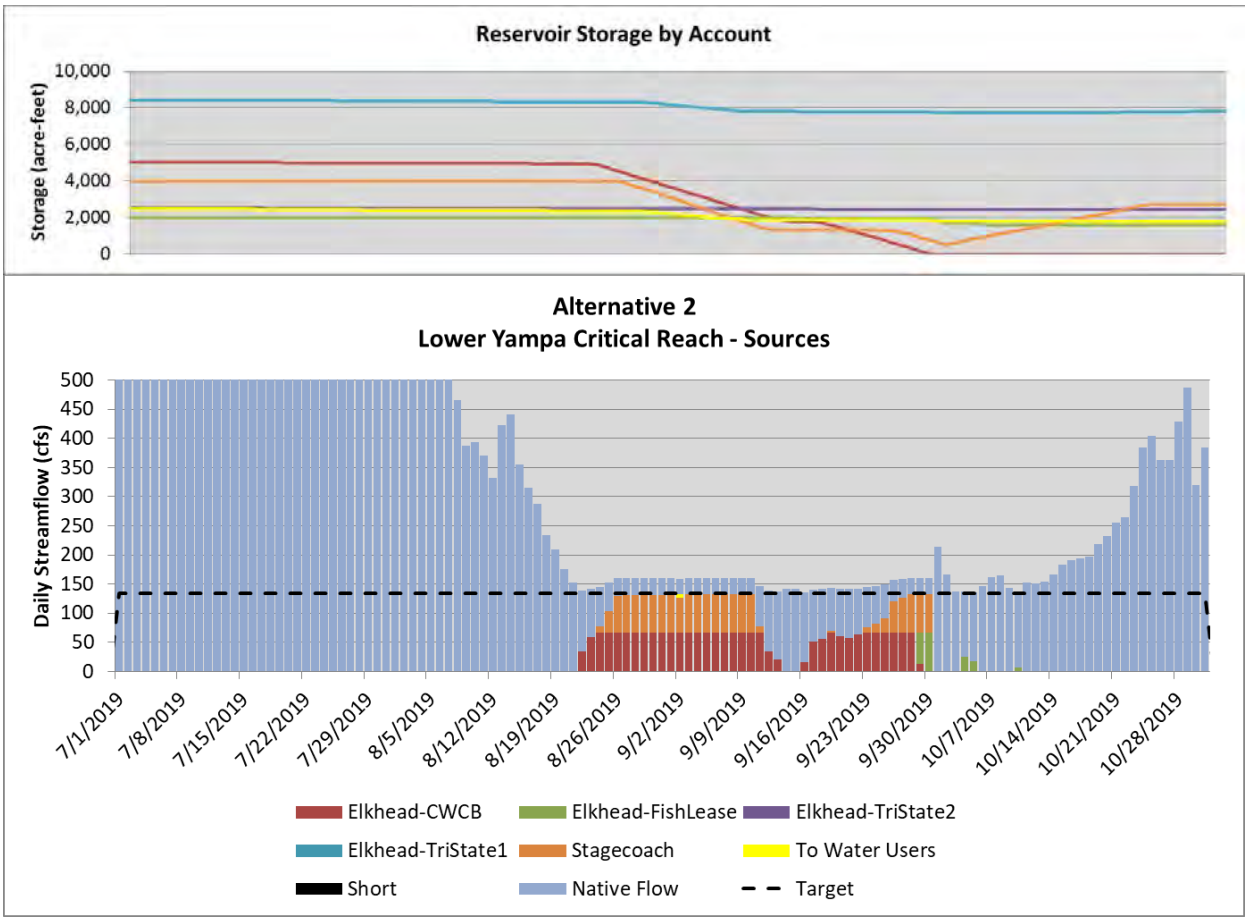


Figure 12: Alternative 2 - Lower Yampa Critical Reach Sources of Water and Reservoir Storage by Account (2019)

As shown, the streamflow target is 134 cfs. Native flow is plentiful in July and most of August. Native flow declines in late August and releases from Elkhead Reservoir begin on August 21. The 75 cfs release limit from Elkhead is reach a few days later and additional water from Stagecoach Reservoir is released. The General Supply account in Stagecoach is pulled down more quickly in 2019 than in 2018 because of the larger streamflow target.

Figure 13 shows results from Alternative 2 in 2020.

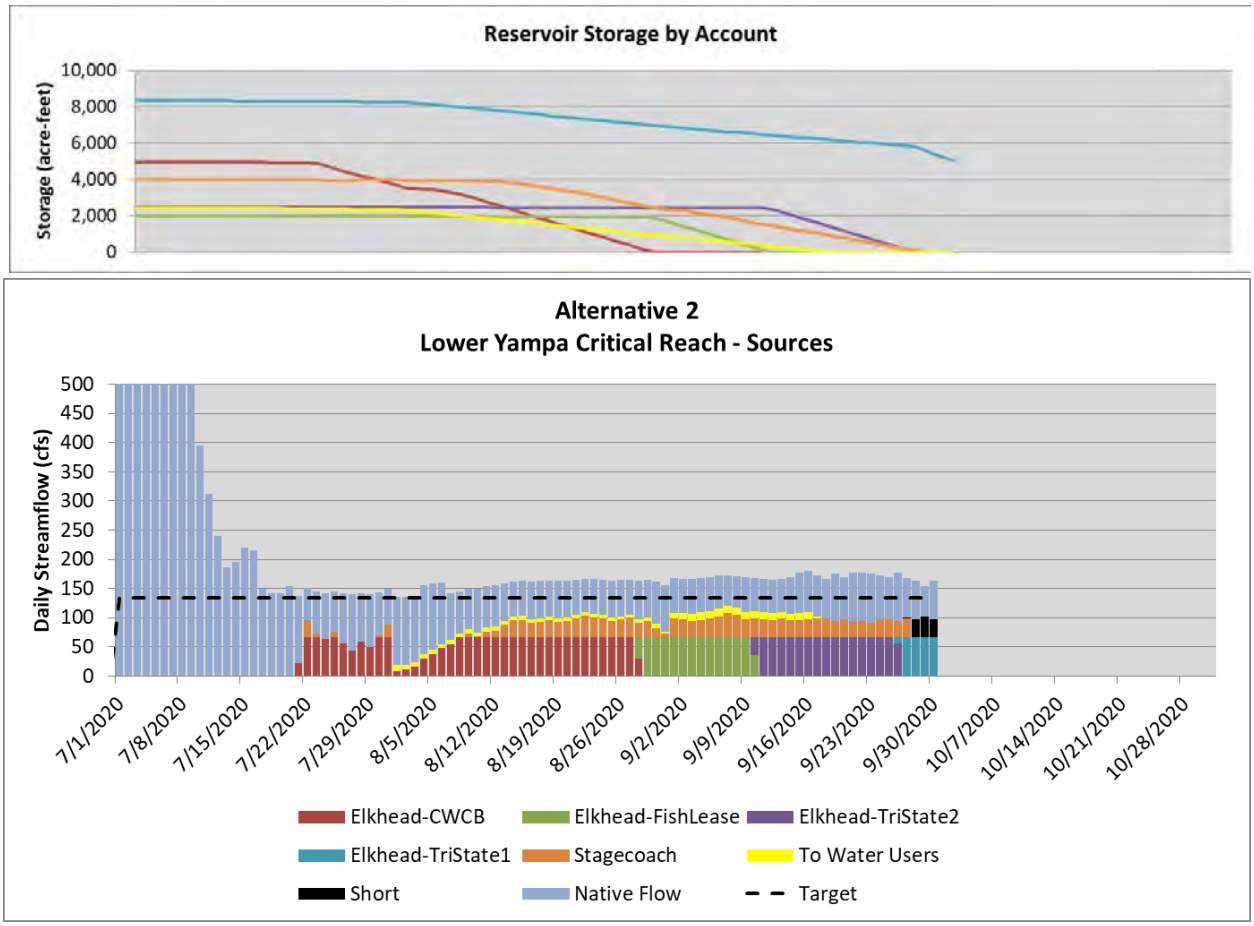


Figure 13: Alternative 2 - Lower Yampa Critical Reach Sources of Water and Reservoir Storage by Account (2020)

The year 2020 was initially categorized as an average year by the Recovery Program, but the flow target was later dropped to 93 cfs due to the dry conditions during August and September. The model does not adjust year-type categorizations "on-the-fly" and uses a target of 134 cfs through the whole season. The model results end on September 30, 2020 because that is the end of the water year. Data for water year 2021 was not available to use in the analysis. Releases from Elkhead Reservoir begin July 21 and from Stagecoach Reservoir on July 22. Due to the low native streamflow and the 134 cfs streamflow target, Elkhead Reservoir released at the maximum release rate from August 8 through September 30. Stagecoach Reservoir supplies are exhausted on September 27 and shortages to the Recovery Program streamflow targets begin on September 28.

Figure 14 presents the volume of annual reservoir release by accounts. The black bars show the volume of shortage to the Recovery Program targets.

Table 11 presents the same information in tabular form. The median total release (considering all sources) is about 9,100 acre-feet.

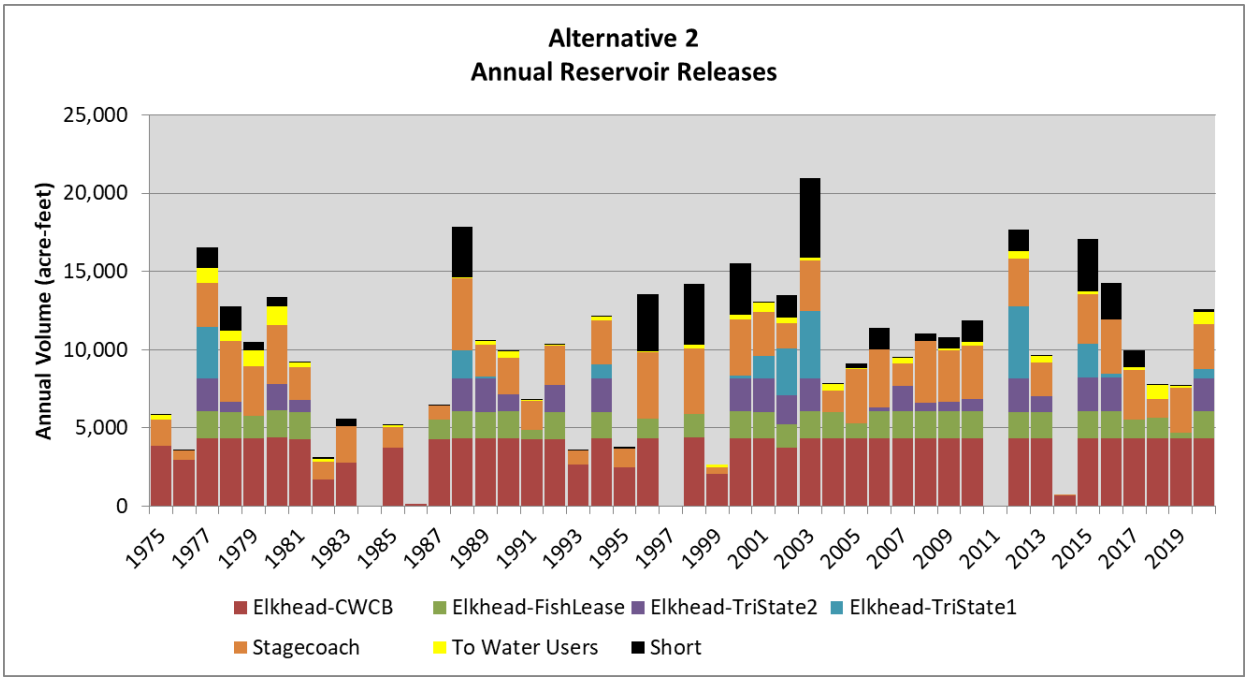


Figure 14: Alternative 2 - Annual Reservoir Release

Table 11: Calendar Year Annual Reservoir Release Volume (acre-feet) and Statistics to the Recovery Program streamflow targets for Alternative 2

Date	Elkhead - CWCB	Elkhead - FishLease	Elkhead - TriState2	Elkhead - TriState1	Stagecoach	Total Release
2000	4,334	1,719	2,137	178	3,548	11,915
2001	4,326	1,716	2,135	1,415	2,852	12,444
2002	3,766	1,491	1,856	2,952	1,610	11,676
2003	4,351	1,697	2,110	4,322	3,249	15,729
2004	4,341	1,695	0	0	1,356	7,392
2005	4,344	937	0	0	3,483	8,763
2006	4,329	1,719	286	0	3,675	10,009
2007	4,348	1,724	1,630	0	1,414	9,116
2008	4,336	1,724	566	0	3,912	10,538
2009	4,356	1,732	582	0	3,301	9,970
2010	4,366	1,735	729	0	3,446	10,275
2011	28	0	0	0	0	28
2012	4,326	1,715	2,134	4,604	3,020	15,799
2013	4,330	1,702	993	0	2,145	9,170
2014	669	0	0	0	14	684
2015	4,336	1,723	2,143	2,154	3,172	13,527
2016	4,351	1,728	2,152	267	3,453	11,951
2017	4,319	1,226	0	0	3,164	8,708
2018	4,323	1,323	0	0	1,215	6,861
2019	4,340	337	0	0	2,920	7,597
2020*	4,333	1,720	2,141	546	2,911	11,651
Min (1975-2020)	*0*	*0*	*0*	*0*	*0*	*0*
Median (1975-2020)	*4,327*	*1,599*	*143*	*0*	*2,423*	*9,143*
Max (1975-2020)	*4,410*	*1,735*	*2,152*	*4,604*	*4,572*	*15,799*
Year of Max	*1980*	*2010*	*2016*	*2012*	*1988*	*2012*

* The modeled year 2020 does not include October.

The following series of figures and tables report results from Alternative 3 for the same years as presented above for Alternative2. The results are similar but show the impact of a larger release rate limit (100 cfs) for Elkhead Reservoir.

Figure 15 shows results from Alternative 3 in 2018, a dry year.

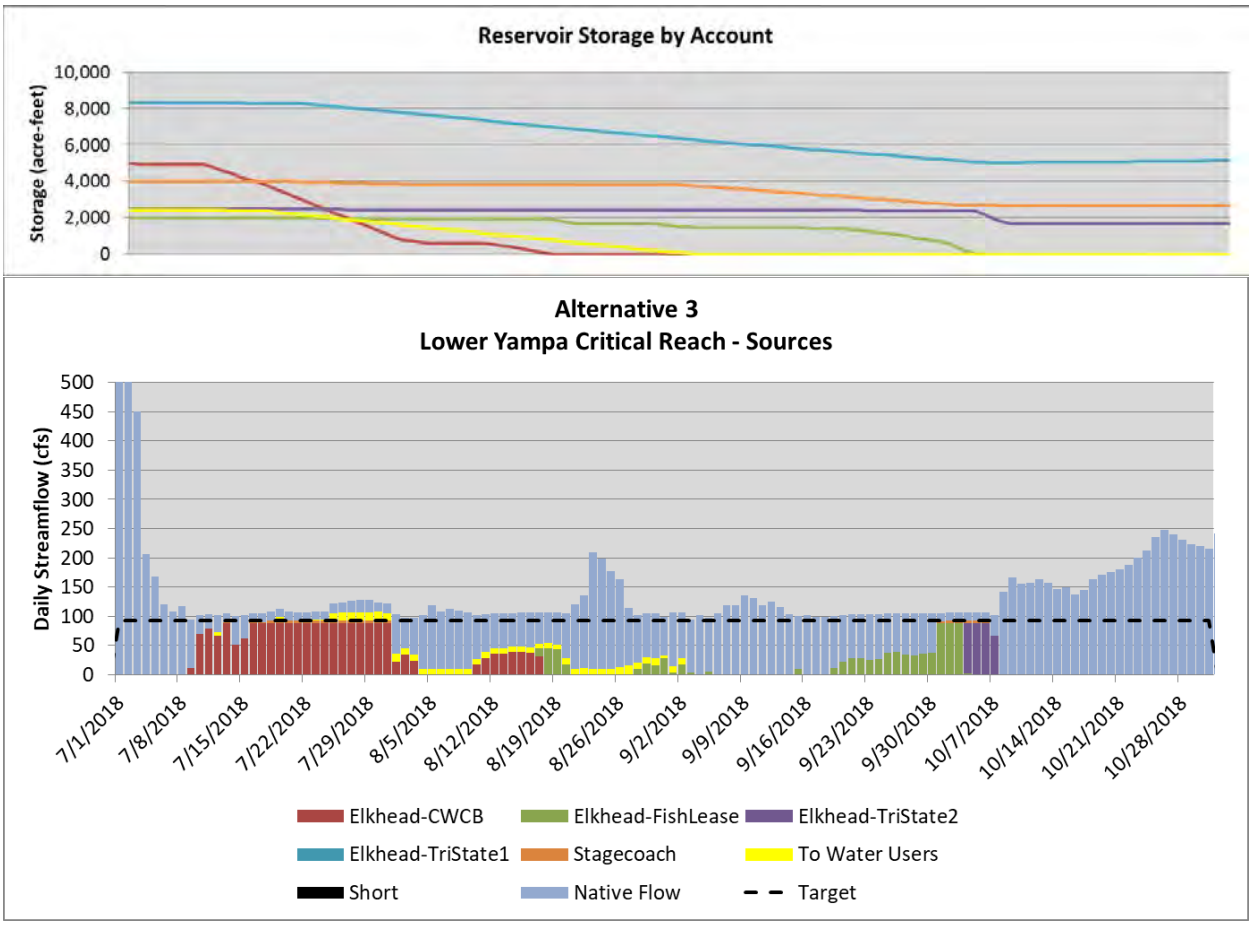


Figure 15: Alternative 3 - Lower Yampa Critical Reach Sources of Water and Reservoir Storage by Account (2018)

As in Alternative 2, the streamflow target is 93 cfs. Figure 40 shows that the native streamflow drops off sharply at the beginning of July. Elkhead Reservoir begins releasing water on July 9, restricted to a release rate of 100 cfs. This results in fewer releases from Stagecoach Reservoir in Alternative 3 than in Alternative 2. The CWCB pool is emptied more quickly in Alternative 3 because of the higher release limit. Releases from the Fish Lease pool start in mid-August instead of the end of September. In early October, the Fish Lease pool is emptied and releases are made from the Tri-State 2 pool. In Alternative 2, water is needed from Stagecoach, but the Fish Lease pool is not emptied. This highlights the trade-offs between release limits.

Figure 15 shows results from Alternative 3 in 2019, an average year.

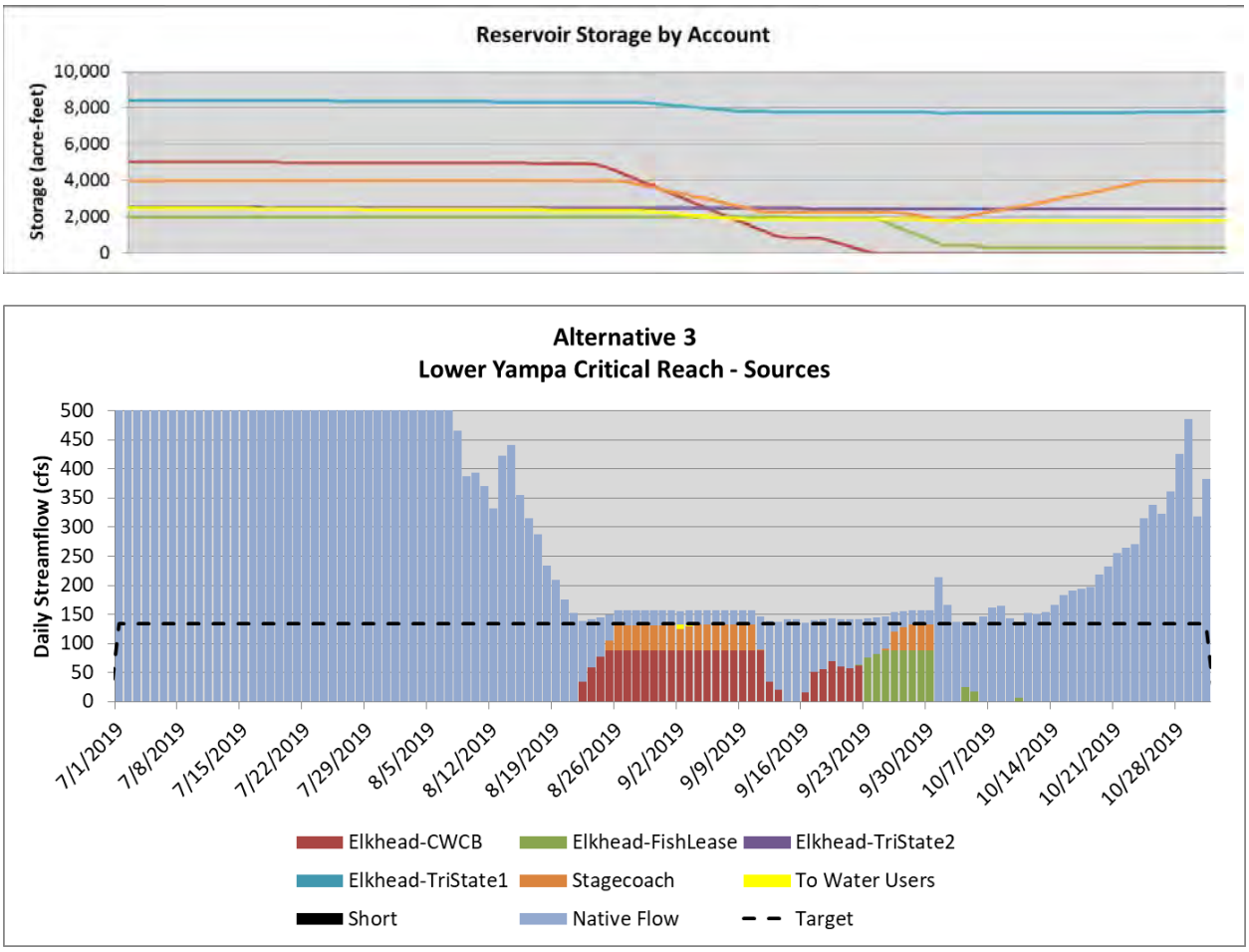


Figure 16: Alternative 3 - Lower Yampa Critical Reach Sources of Water and Reservoir Storage by Account (2019)

The 100 cfs release limit from Elkhead is reach a few days later and additional water from Stagecoach Reservoir is released. Similar to 2018, less water is needed from Stagecoach in Alternative 3 than Alternative 2 because of the higher release limit.

Figure 17 shows results from Alternative 3 in 2020.

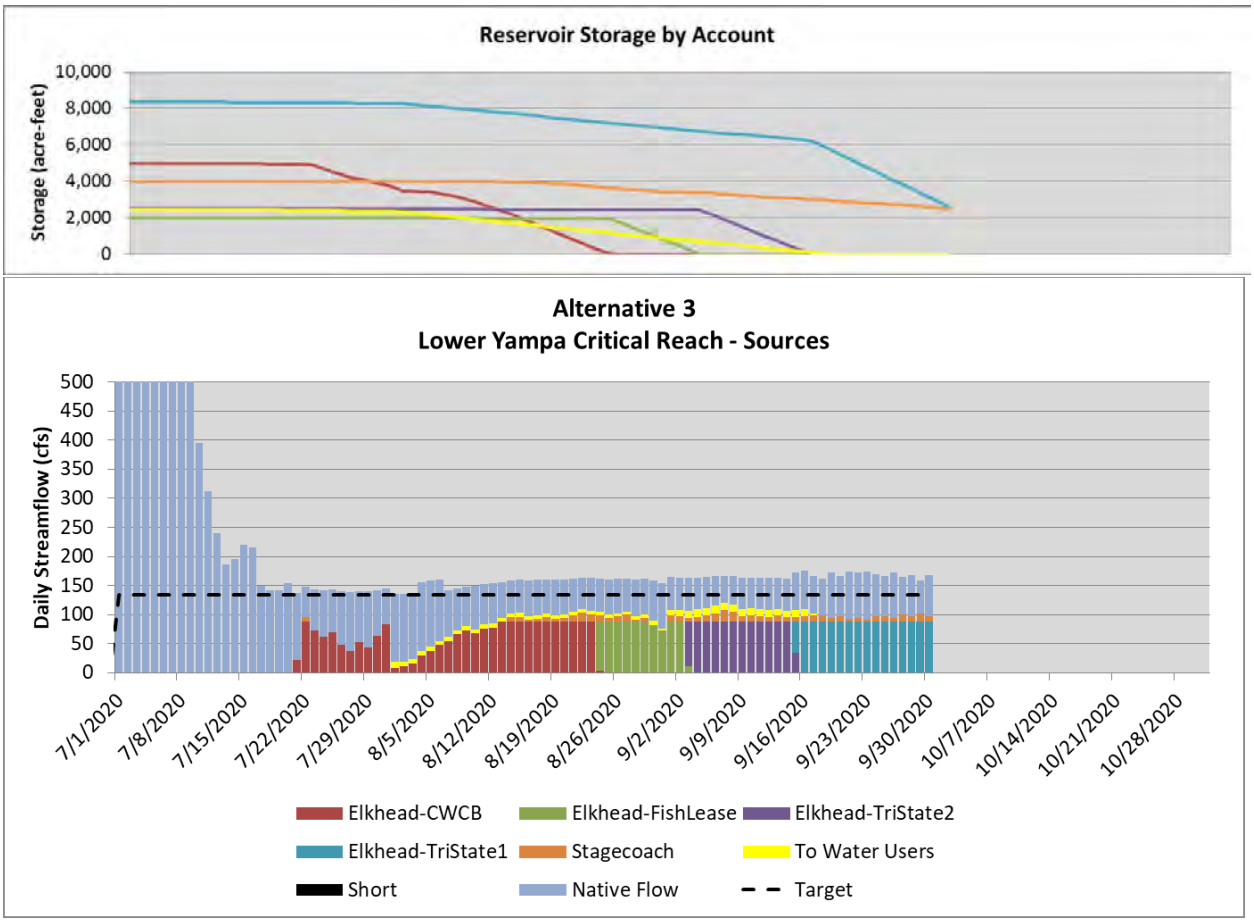


Figure 17: Alternative 3 - Lower Yampa Critical Reach Sources of Water and Reservoir Storage by Account (2020)

As in Alternative 2, releases from Elkhead Reservoir begin July 21. However, releases from Stagecoach are delayed until mid-August due to the higher release rate. Elkhead Reservoir releases at the maximum release rate from August 13 through September 30. Unlike Alternative 2, Stagecoach Reservoir supplies are not exhausted. Shortages to the Recovery Program are avoided. The trade-off is that a larger volume of water is released from Elkhead Reservoir.

Figure 18 presents the volume of annual reservoir release by accounts. The black bars show the volume of shortage to the Recovery Program targets.

Table 12 presents the same information in tabular form. The median total release (considering all sources) is about 9,500 acre-feet.

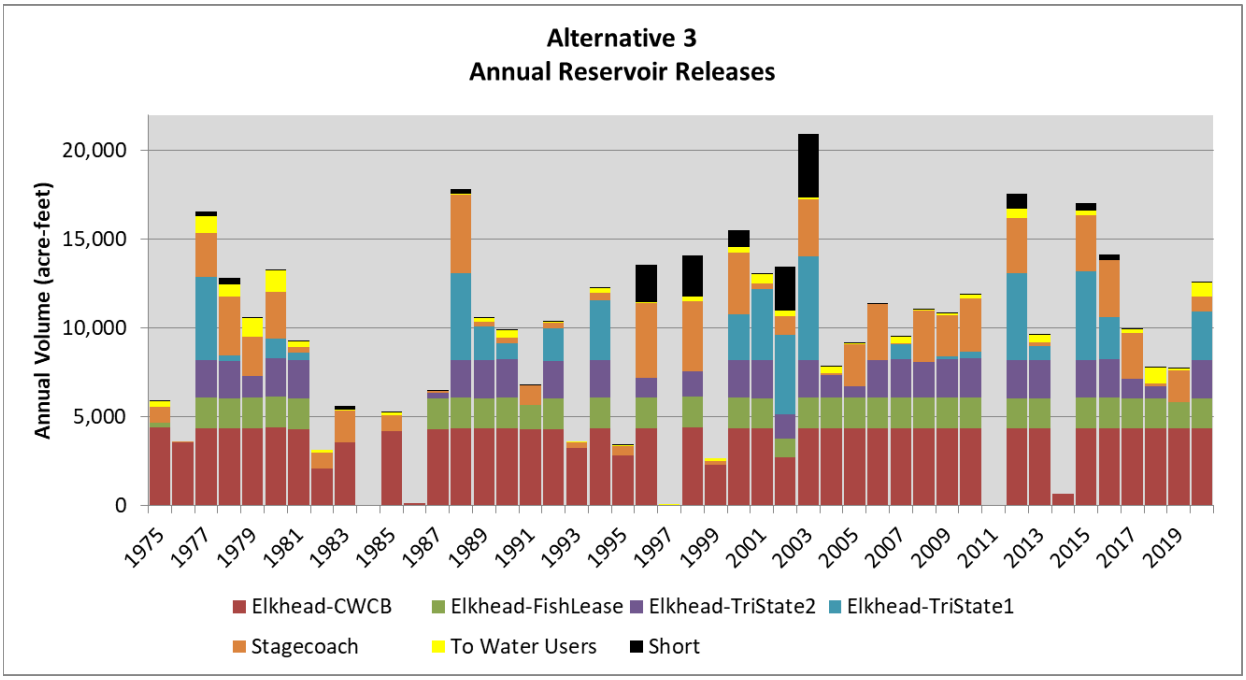


Figure 18: Alternative 3 - Annual Reservoir Release

Table 12: Annual Reservoir Release Volume (acre-feet) and Statistics to the Recovery Program streamflow targets for Alternative 3

Date	Elkhead - CWCB	Elkhead - FishLease	Elkhead - TriState2	Elkhead - TriState1	Stagecoach	Total Release
2000	4,340	1,725	2,147	2,557	3,466	14,235
2001	4,334	1,720	2,142	3,981	308	12,484
2002	2,700	1,075	1,338	4,478	1,098	10,688
2003	4,357	1,702	2,119	5,842	3,221	17,241
2004	4,347	1,726	1,252	0	103	7,429
2005	4,347	1,731	635	0	2,393	9,106
2006	4,335	1,724	2,118	0	3,154	11,330
2007	4,352	1,727	2,150	859	49	9,138
2008	4,341	1,726	2,015	0	2,904	10,986
2009	4,359	1,735	2,162	155	2,282	10,692
2010	4,370	1,740	2,168	392	2,991	11,661
2011	28	0	0	0	0	28
2012	4,332	1,719	2,141	4,879	3,112	16,183
2013	4,335	1,705	2,124	819	231	9,214
2014	683	0	0	0	0	683
2015	4,338	1,726	2,151	4,997	3,158	16,371
2016	4,352	1,732	2,157	2,344	3,216	13,801
2017	4,321	1,720	1,095	0	2,577	9,714
2018	4,334	1,703	653	0	174	6,864
2019	4,344	1,465	0	0	1,808	7,617
2020*	4,334	1,723	2,147	2,735	820	11,758
Min (1975-2020)	*0*	*0*	*0*	*0*	*0*	*0*
Median (1975-2020)	*4,334*	*1,714*	*1,398*	*0*	*875*	*9,482*
Max (1975-2020)	*4,412*	*1,743*	*2,168*	*5,842*	*4,410*	*17,499*
Year of Max	*1980*	*1998*	*2010*	*2003*	*1988*	*1988*

* The modeled year 2020 does not include October.

To understand the model results, it is important to determine if available storage or the Elkhead release limits are the most restrictive factor. Table 13 presents the number of years with a shortage volume. Alternative 2 has 25 years with shortages compared to 12 years in Alternative 3. Fewer years with shortages indicate that the higher release rate of 100 cfs in Alternative 3 helps to meet the shortages to the Recovery Program streamflow targets. Additionally, Figure 19 shows the annual shortage volume to the Recovery Program for Alternative 2 and 3. Of the years with shortages, there is one year with more shortage volume in Alternative 3 than Alternative 2. In the other years with shortages, the annual shortage volume is smaller in Alternative 3 than Alternative 2. When additional water from the Tri-State pools are made available to the Recovery Program, the release rate is the most restrictive factor.

Table 13: Count of Years with Shortage to the Recovery Program Streamflow Targets

Total Years with Shortage	
Alternative 2	25
Alternative 3	12

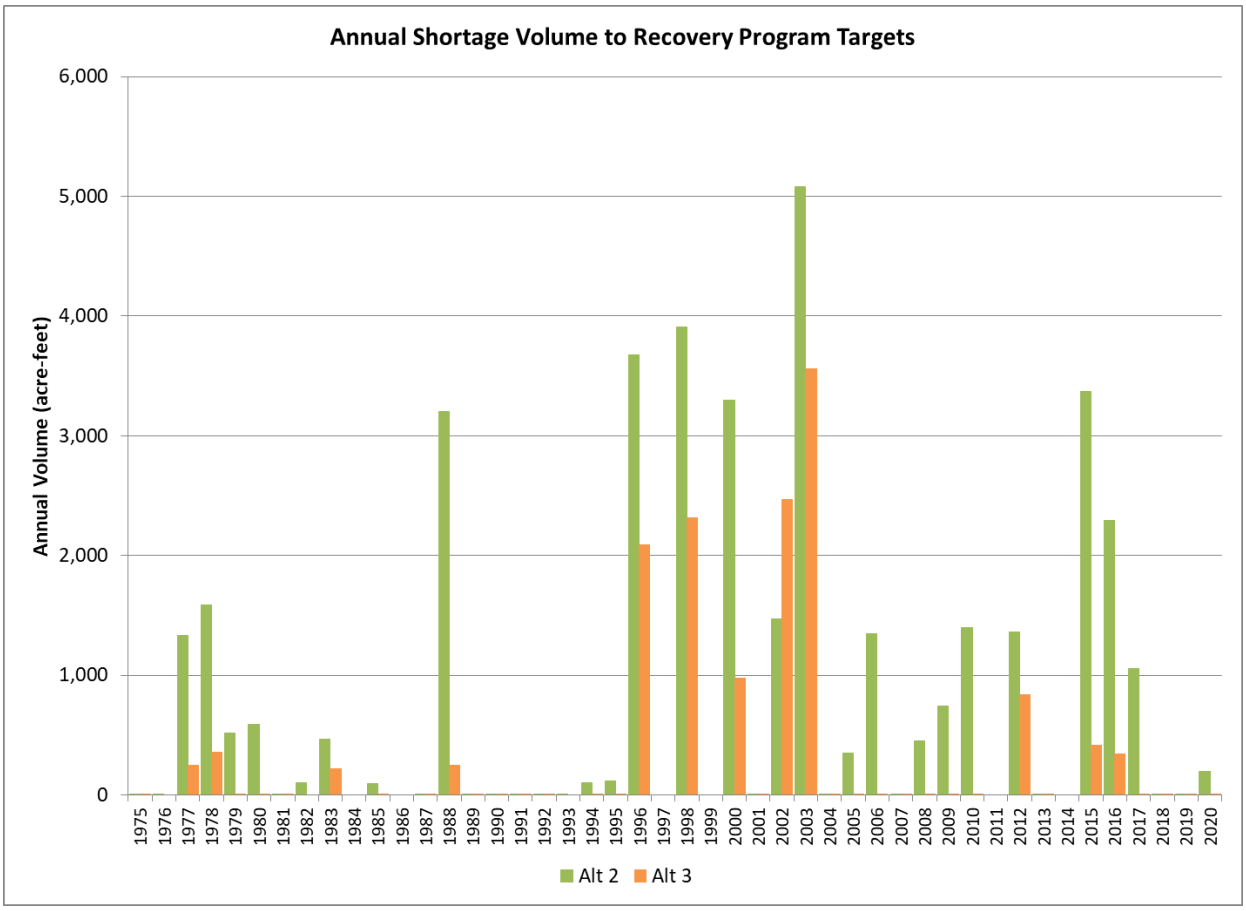


Figure 19: Annual Shortage Volume to Recovery Program Targets

Finally, the annual shortage volume to the Recovery Program streamflow targets were compared to the remaining storage volume in the available pool in Elkhead Reservoir and Stagecoach Reservoir to determine if there was sufficient volume to fully meet the streamflow targets if there were not a release rate constraint. For both Alternatives 2 and 3, the years 2002, 2003 and 2012 do not have sufficient volume to fully meet the streamflow target. In these three years, Alternative 3 has completely exhausted available storage; a larger flow release rate would have allowed the model to fully meet the streamflow targets except in those three years.

Figure 20 and Figure 21 show the results from Alternative 3 for 2003 and 2012 to illustrate what causes storage to be exhausted in dry years.

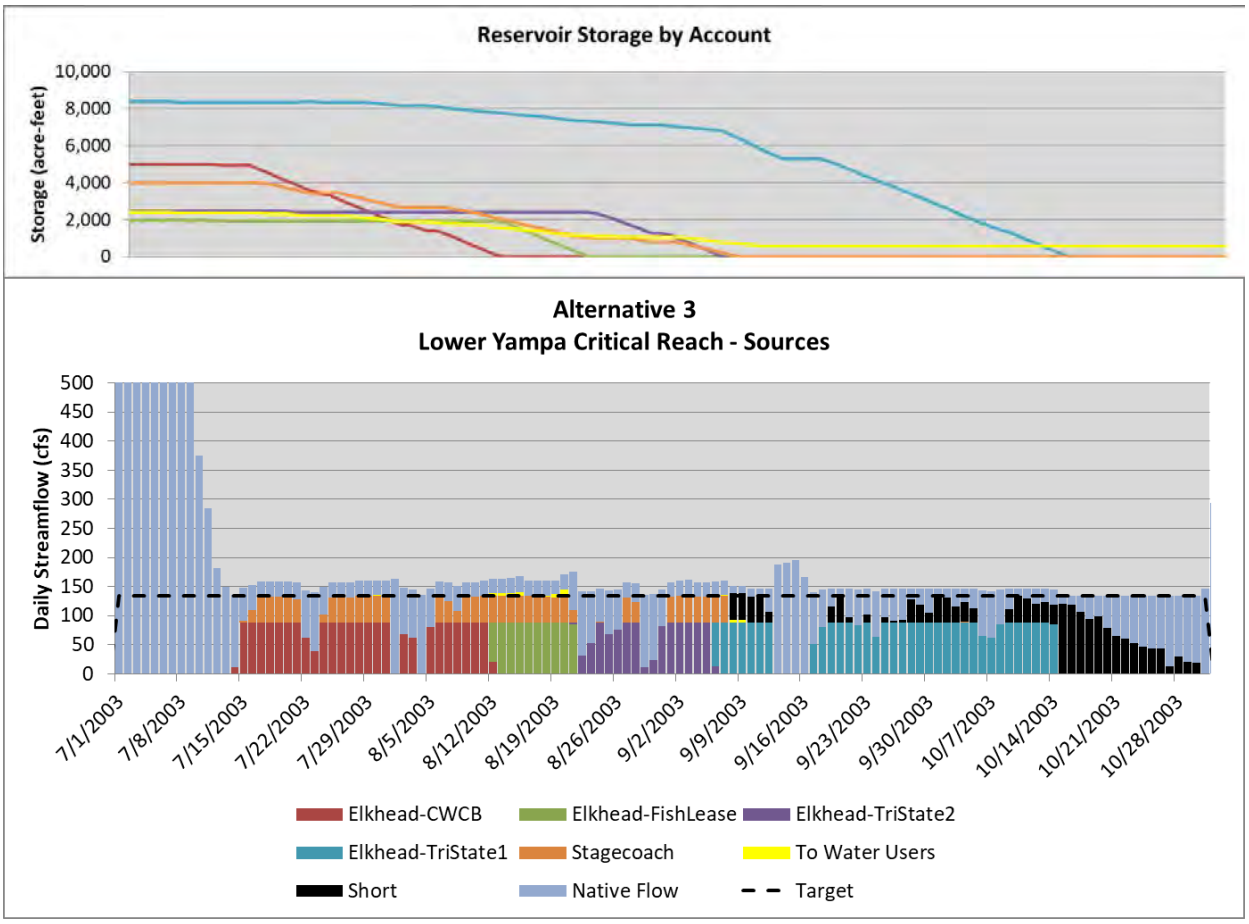


Figure 20: Alternative 3 - Lower Yampa Critical Reach Sources of Water and Reservoir Storage by Account (2003)

Figure 20 shows results from Alternative 3 in 2003. This year is considered an average year by the model but has relatively small native streamflow during the late irrigation season, dropping off sharply by mid-July. The streamflow target is 134 cfs. Elkhead Reservoir begins releasing water on July 14, restricted to release rate of 100 cfs. For multiple days in July, releases made at the 100 cfs rate do not meet the flow target and additional water is released from Stagecoach Reservoir. Elkhead CWCB pool is exhausted on August 12 and releases from the Fish Lease pool begin. When the Fish Lease pool is exhausted on August 22, releases begin from the Tri-State 2 pool. On September 6, the Tri-State 2 pool is empty and releases start from the Tri-State 1 pool. On September 8, the water in Stagecoach is exhausted and shortages begin. The Elkhead releases, limited to 100 cfs, continue through October 14, with small daily shortages to the 134 cfs target. Then the Tri-State 1 pool is exhausted and large shortages occur until the native streamflow recovers towards the end of October.

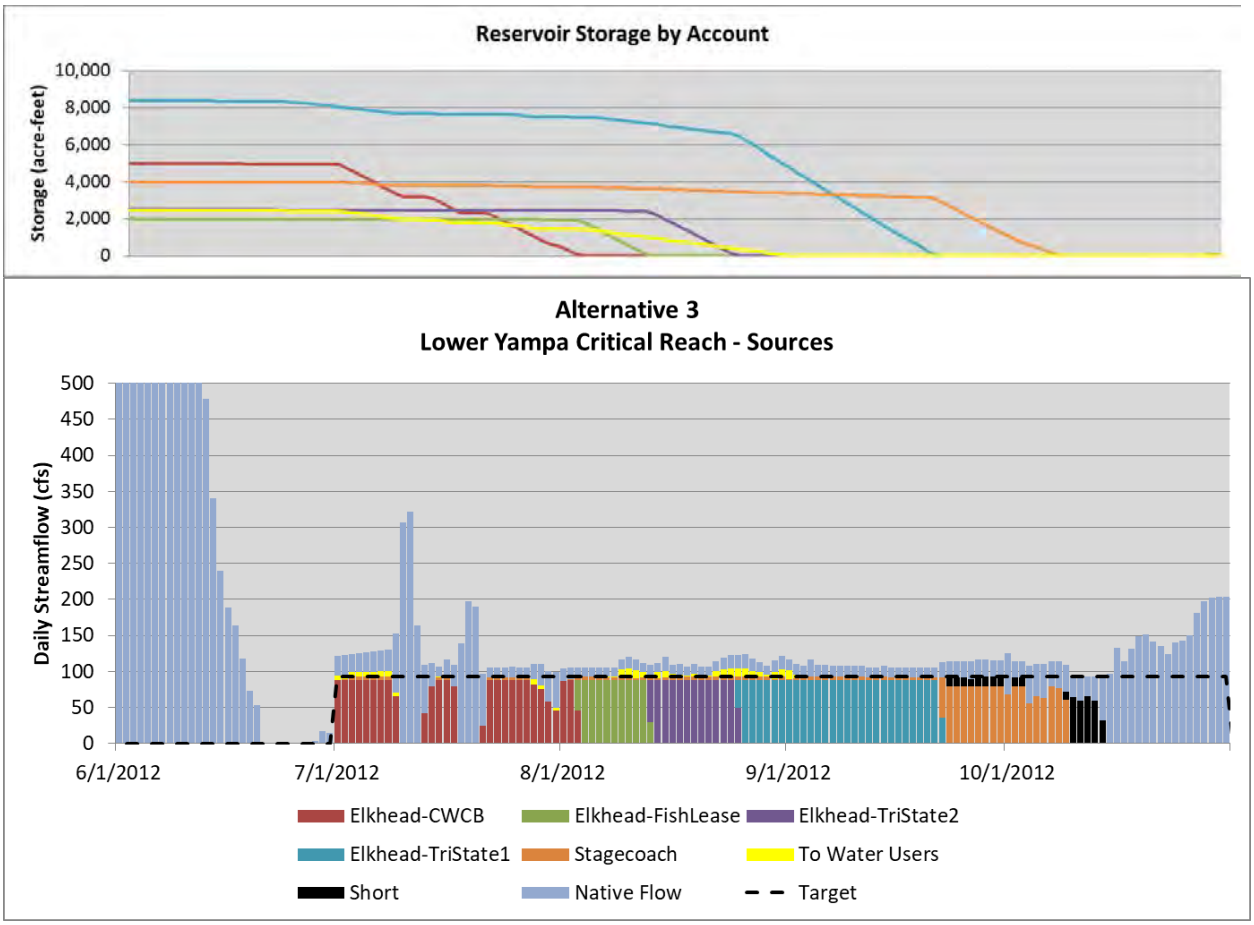


Figure 21: Alternative 3 - Lower Yampa Critical Reach Sources of Water and Reservoir Storage by Account (2012)

Figure 21 shows results from Alternative 3 in 2012, a dry year. Notice that the graph is extended to show the month of June. The model limits releases to the months of July through October, so the low streamflow in June is not supplemented by releases from the reservoirs. The streamflow target from July through October is 93 cfs. The native streamflow drops off sharply in June. Elkhead Reservoir begins releasing water on July 1; even though releases clearly would have been beneficial in late June. Releases are restricted to 100 cfs. There are two rainfall events in July that provide sufficient native streamflow for several days. Outside of the rainfall events, the release limit is reached and small amounts of additional water are released from Stagecoach Reservoir. Elkhead CWCB pool is exhausted on August 3 and releases from the Fish Lease pool begin. When the Fish Lease pool is exhausted on August 14, releases begin from the Tri-State 2 pool. On August 24, the Tri-State 2 pool is exhausted and releases start from Tri-State 1 pool. On September 21, the Tri-State 1 water is exhausted and the releases from Stagecoach increase up to the release limit of 100 cfs. Note that releases from Stagecoach are charged with higher (21.3 percent) transit loss, resulting in only 78.7 cfs arriving at the Maybell gage. The Stagecoach pool is exhausted on October 10 and large shortages occur until the native streamflow recovers six days later.

In 2012, the need for supplemental reservoir water is greater than the supply. If the model released water in June, additional shortages would have been realized in October.

The years 2003 and 2012 highlight an important difference between model operations and the approach historically taken by the Recovery Program. As discussed above, StateMod does not consider forecasts in model operations. Therefore, the model releases up to the release limit (75 cfs or 100 cfs) to meet shortages, until the reservoir supplies are exhausted. This allows for consistent operations and simplifies comparison of results. However, it does not replicate the historical decision-making process to set the release rates. For example, the Recovery Program would consider the remaining volume of water in storage and the streamflow forecasts. At the beginning of a dry year, the Recovery Program may decide to hold back water in July in order to preserve supplies for October. They may decide that small shortages in July are better than incurring the risk of very large shortages in October. Or in the case of 2012, the Recovery Program may have reduced the streamflow target to 93 cfs due to the very low native streamflow. Additionally, the Recovery Program would likely reduce releases when they were getting close to the end of the reservoir storage, spreading out the shortages over more days, but not allowing a large shortage at the end of the season. The model releases to fully meet the demands without consideration for the next time step.

Table 14 presents the number and percent of days in each year that meet the maximum Elkhead Reservoir release limit for Baseline, Alternative 2 and 3. The percent of days is based on the 123 days in July through October.

Table 14: Number and Percent of Days that Meet the Maximum Elkhead Release Limit

Date	Baseline (50 cfs)		Alternative 2 (75 cfs)		Alternative 3 (100 cfs)	
	Number of Days	% of Days	Number of Days	% of Days	Number of Days	% of Days
1975	28	23%	20	16%	14	11%
1976	21	17%	17	14%	10	8%
1977	66	54%	82	67%	66	54%
1978	49	40%	44	36%	38	31%
1979	43	35%	37	30%	28	23%
1980	54	44%	46	37%	33	27%
1981	46	37%	44	36%	39	32%
1982	10	8%	10	8%	8	7%
1983	19	15%	18	15%	17	14%
1984	0	0%	0	0%	0	0%
1985	19	15%	16	13%	9	7%
1986	0	0%	0	0%	0	0%
1987	34	28%	24	20%	14	11%
1988	67	54%	72	59%	68	55%
1989	58	47%	45	37%	33	27%
1990	51	41%	48	39%	41	33%
1991	25	20%	19	15%	17	14%

1992	57	46%	54	44%	44	36%
1993	17	14%	14	11%	11	9%
1994	62	50%	64	52%	50	41%
1995	14	11%	14	11%	9	7%
1996	39	32%	37	30%	36	29%
1997	0	0%	0	0%	0	0%
1998	41	33%	41	33%	38	31%
1999	10	8%	5	4%	4	3%
2000	61	50%	58	47%	53	43%
2001	66	54%	66	54%	46	37%
2002	65	53%	66	54%	50	41%
2003	66	54%	81	66%	66	54%
2004	44	36%	35	28%	19	15%
2005	36	29%	34	28%	32	26%
2006	46	37%	45	37%	41	33%
2007	55	45%	41	33%	14	11%
2008	46	37%	38	31%	31	25%
2009	48	39%	45	37%	37	30%
2010	48	39%	43	35%	41	33%
2011	0	0%	0	0%	0	0%
2012	66	54%	91	74%	66	54%
2013	52	42%	50	41%	33	27%
2014	3	2%	1	1%	0	0%
2015	64	52%	72	59%	59	48%
2016	58	47%	55	45%	45	37%
2017	39	32%	37	30%	36	29%
2018	29	24%	27	22%	23	19%
2019	34	28%	28	23%	24	20%
2020*	61	50%	59	48%	47	38%
Min	*0*		*0*		*0*	
Median	*45*		*39.5*		*33*	
Max	*67*		*91*		*68*	
Year of Max	*1988*		*2012*		*1988*	

* The modeled year 2020 does not include October.

Elkhead and Stagecoach Reservoir Storage

The final set of results show the storage levels in Elkhead Reservoir and Stagecoach Reservoir. Figure 22 and Figure 23 compare the storage contents for Elkhead Reservoir and Figure 24 compares the storage contents for Stagecoach Reservoir.

Figure 22 highlights Elkhead Reservoir contents from 2007 through 2020 as this is the period that corresponds with the Elkhead enlargement.

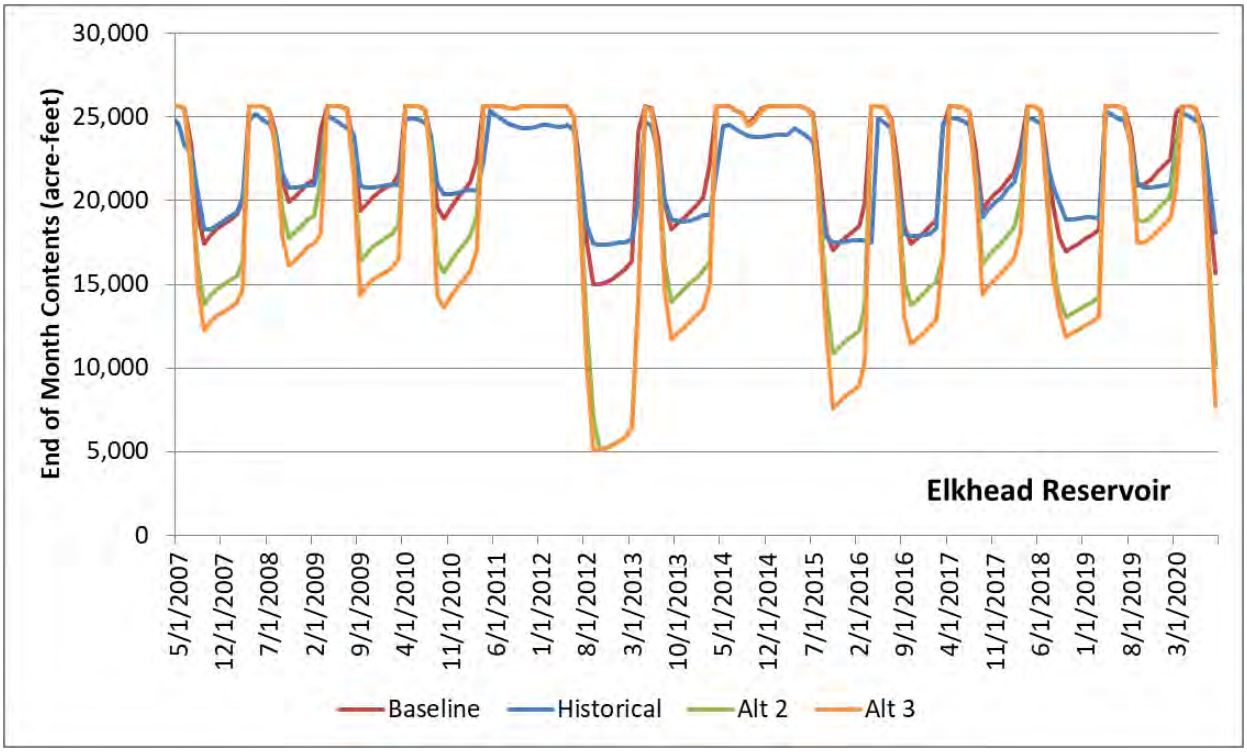


Figure 22: Comparison of Elkhead Reservoir Storage Contents (2007 - 2020)

The key observation from Figure 22 is that the Historical and Baseline reservoir contents are very similar. In both of these simulations, the Elkhead release limit to the Recovery Program is 50 cfs. This gives us confidence to compare the Baseline scenario to Alternative 2 and 3 for the full model period. Note that the City of Craig account and dead storage in Elkhead Reservoir keeps the minimum storage levels around 5,000 acre-feet.

Figure 23 shows Elkhead Reservoir contents for the full model simulation period.

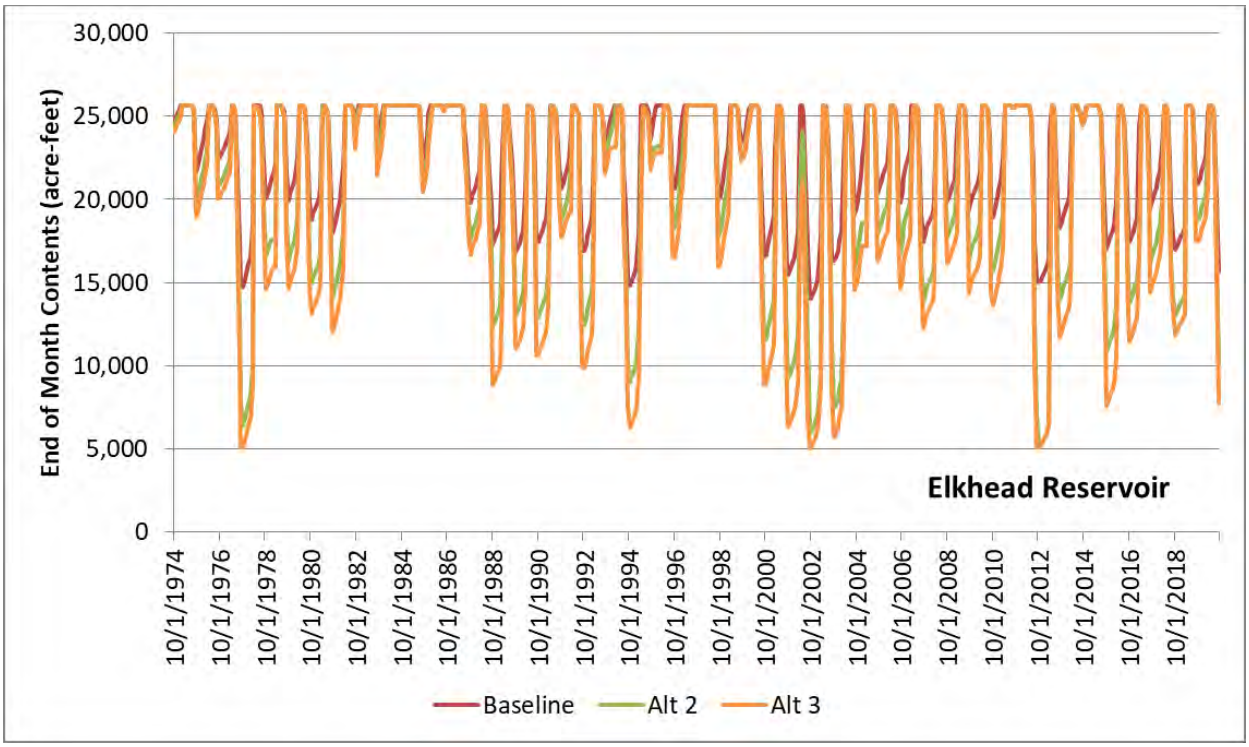


Figure 23: Comparison of Elkhead Reservoir Storage Contents (2007 - 2020)

The most obvious difference between Baseline and Alternative 2 and 3 is the frequency and magnitude of the change in reservoir storage contents. In the Baseline scenario, the reservoir levels do not drop below 14,000 acre-feet. The reservoir stays above 20,000 acre-feet in most years. For Alternative 2 and 3, the reservoir regularly drops below 20,000 acre-feet and, in several years, drops below 10,000 acre-feet. In 1977, 2002, 2003, and 2012, the storage available to the agricultural users and the Recovery Program is exhausted and the reservoir reaches minimum storage level of 5,000 acre-feet. Alternative 3 generally shows lower storage levels than Alternative 2.

The model shows that there is one year (2002) when Elkhead Reservoir does not refill under the Alternative scenarios. The reservoir is pulled down in 2001 and is unable to fully recover during 2002.

Water users in the basin have not experienced as much variation in Elkhead storage as occurs in the Alternative scenarios.

Figure 24 compares the storage contents for Stagecoach Reservoir for the full model period of 1975 through 2020. Note that the model represents a low level of contracted water out of the total amount available in Stagecoach Reservoir. In 2020, about 3,300 acre-feet of Stagecoach storage was under contract. The model represents about 2,100 acre-feet of contracted water, primarily for municipal and domestic water providers. As discussed in the “Baseline” section above, the model does not represent a contract with the Colorado Water Trust.

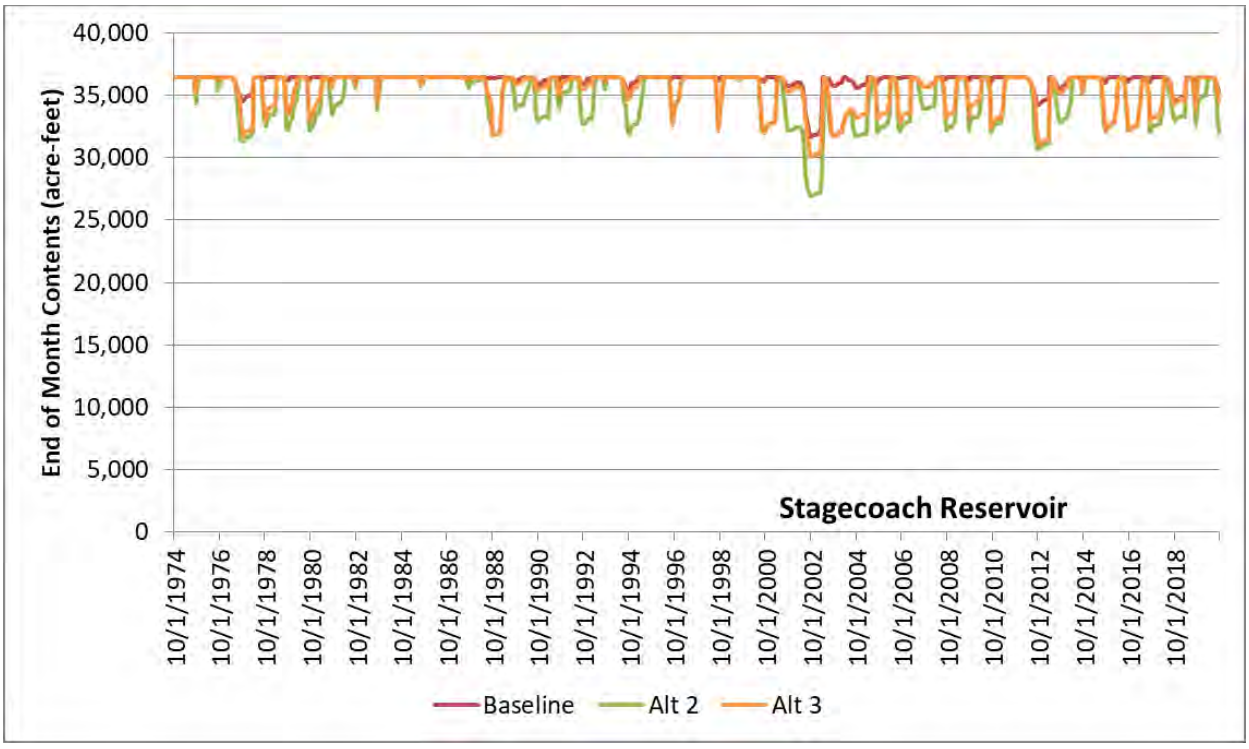


Figure 24: Comparison of Stagecoach Reservoir Storage Contents (1975 - 2020)

Stagecoach Reservoir is only contributing water from the General Supply account (4,000 acre-feet). Therefore, there is less of a change between Baseline and Alternatives 2 and 3. In Baseline, Stagecoach Reservoir does not refill in 2002. Similar to Elkhead Reservoir, the dry conditions in 2001 cause substantial releases from storage and the small amount of runoff in 2002 is not sufficient for the reservoir to fully recover. Additionally, in Alternative 2 and 3, Stagecoach does not refill in 2004. The reservoir was again pulled down in 2003 and the runoff in 2004 is not enough to allow the reservoir to refill.

Summary of Results

This modeling project explored two alternative reservoir release scenarios. The key observations from the modeling results are:

- Releases to agricultural users downstream of Elkhead Reservoir can serve multiple purposes. First, it reduces shortages to those users directly. Second, shortages to upstream diverters are also improved because the call on the river is less senior. Third, the reservoir release supports streamflow in the Lower Yampa Reach until the point of diversion.
    - These releases reduced agricultural shortages to downstream users on average by about 80 percent in both Alternative 2 and 3 when compared to Baseline shortages.
    - In dry years, shortages are reduced on average by about 95 percent.
- Increasing both the volume of water and the maximum release rate from Elkhead Reservoir at the same time can improve streamflow levels in the Lower Yampa Reach. However, without

access to additional storage water, an increased release rate will draw down the current supplies more quickly and could result in late-season shortages.

- Supplies from Stagecoach Reservoir can improve streamflow conditions in the Lower Yampa Reach, but have a higher transit loss than Elkhead Reservoir. Releases from Stagecoach Reservoir can add water to the stream when Elkhead Reservoir releases are restricted by the maximum release rate.
- The alternative scenarios exercised Elkhead Reservoir more frequently and to lower storage levels than current operations. The model showed Elkhead Reservoir refilling in every year except 2002. The trade-offs between the benefits of water remaining in the reservoir compared to the benefits of water in the stream will need to be considered.

Look Back at 2020 Technical Memo

Motivation

The Yampa River has rarely experienced a mainstem call. The first mainstem call was placed in 2018, followed by a mainstem call in 2020 and 2021. The Division of Water Resources, water users and reservoir operators are gaining experience in how to efficiently administer these mainstem calls. The funders are interested in documenting the specifics of the 2020 mainstem call and related reservoir releases in order to preserve the knowledge and use as a learning experience for 2021 and beyond.

Streamflow Conditions

As shown in Figure 25, the snowpack conditions in water year 2020 were slightly above the median throughout the winter. The snowpack peaked twice, reaching 110 percent of normal in early April and again in mid-April. However, the snowpack quickly melted in the months of May and June due to warm temperatures.

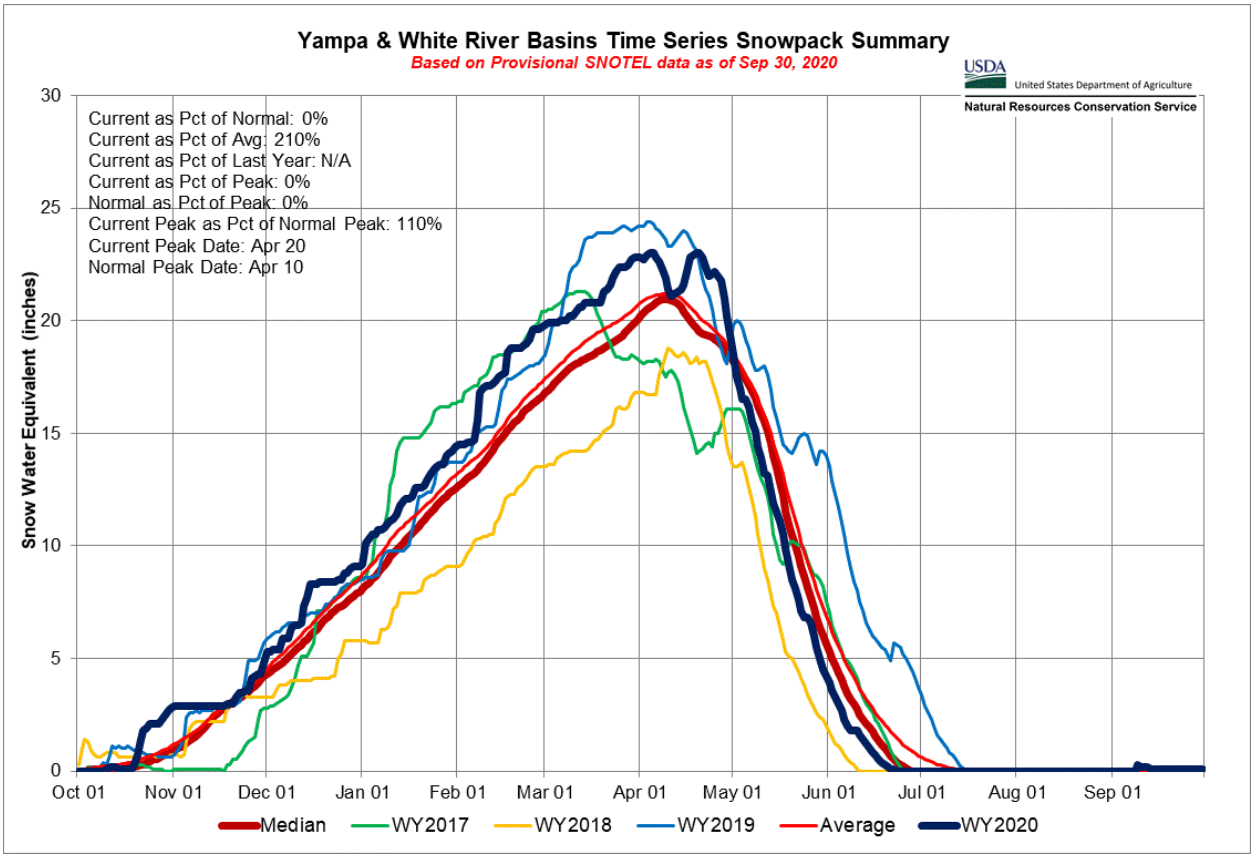


Figure 25: Yampa and White River Basins Time Series Snowpack Summary from NRCS

Figure 26 compares the daily streamflow for the Yampa River near Maybell and at Deerlodge Park for 2020 with the long term median daily streamflow. The median was calculated using the full gage record. For the Yampa River near Maybell (USGS gage 09251000), the period of record is May 1, 1916 through present. For the Yampa River at Deerlodge Park (USGS gage 09260050), the period of record is October 1, 1982 through present.

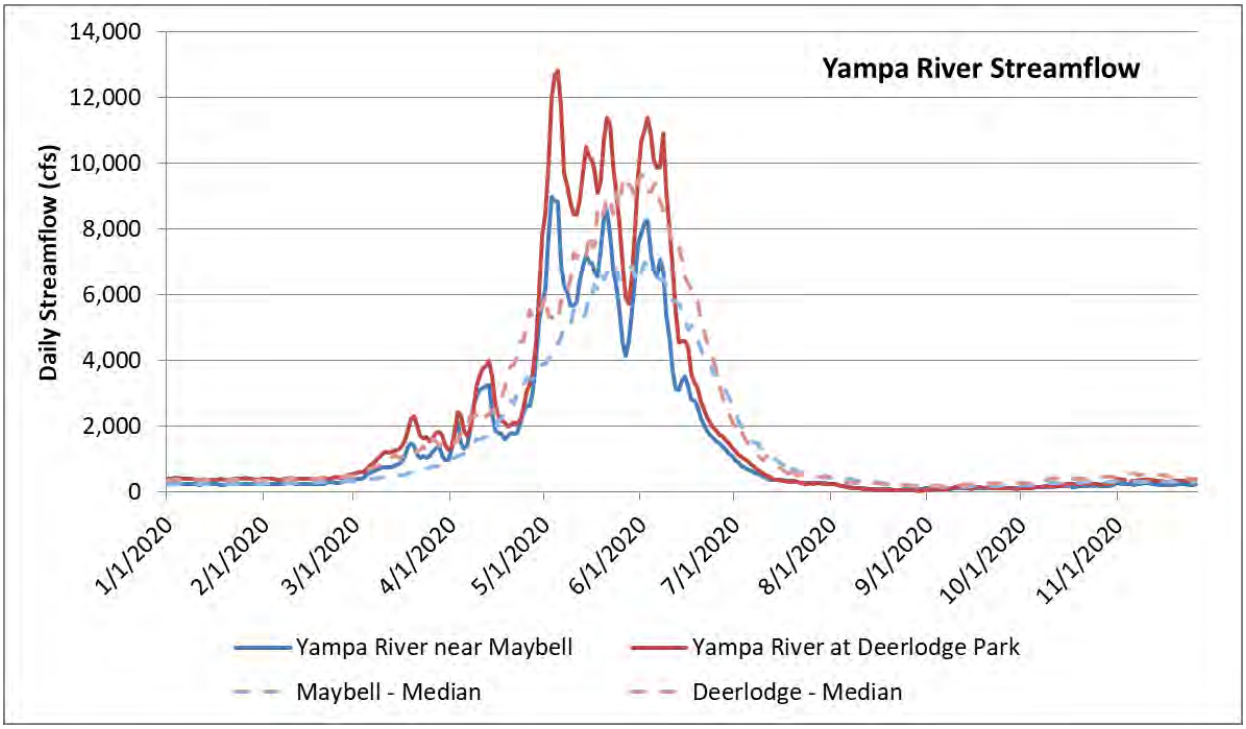


Figure 26: Yampa River Streamflow for 2020 compared to long-term daily median streamflow

Key observations from the streamflow graph are:

- Streamflow in early and mid-May was higher than normal.
- Streamflow dropped in late May, but rebounded to above normal flows for about a week at the start of June.
- Streamflow levels declined in June more quickly than normal.
- Streamflow in July, August, September, and October were lower than normal.

Recovery Program

In 2005, the United States Fish and Wildlife Service (USFWS) issued a Final Programmatic Biological Opinion (PBO) on the *Management Plan for the Endangered Fish in the Yampa River Basin* (USFWS 2005). A key component of the Management Plan was the enlargement of Elkhead Reservoir to provide storage water to supplement late-season streamflows through the designated critical habitat reach on the Yampa River, which extends from the City of Craig to the Green River confluence. For the purposes of this memo, this critical habitat reach will be referred to as the "Lower Yampa Reach". The Recovery Program takes a collaborative approach to managing releases from Elkhead Reservoir. A weekly phone

call is held to discuss conditions and determine the release rate. Generally, decisions are made based on the real-time observed streamflow at the USGS gage Yampa River near Maybell.

The Recovery Program considers the forecasted streamflow from April through July at the Maybell gage to assign the year type as wet, average, or dry. The wettest 25 percent of years are assigned as wet years and the driest 25 percent of years are assigned as dry years. Table 2 reports the Recovery Program streamflow targets by year type. The Recovery Program began operating supplemental releases from Elkhead Reservoir in 2007. Generally, the Recovery Program focuses on supplementing streamflow from July through October.

Table 15: Recovery Program Streamflow Targets for the Lower Yampa Reach by Year Type

Year Type	Streamflow Target (cfs)
Wet	200
Average	134
Dry	93

Initially, the Recovery Program categorized 2020 as an “average” year type based on the forecasted streamflows. This sets the streamflow target at 134 cfs. However, the streamflow levels dropped to extremely low levels in August. This is highlighted in Figure 27, which shows the observed Yampa River streamflow at the Maybell and Deerlodge gages and the Little Snake near Lily streamflow. The Recovery Program subsequently changed the streamflow target to 93 cfs.

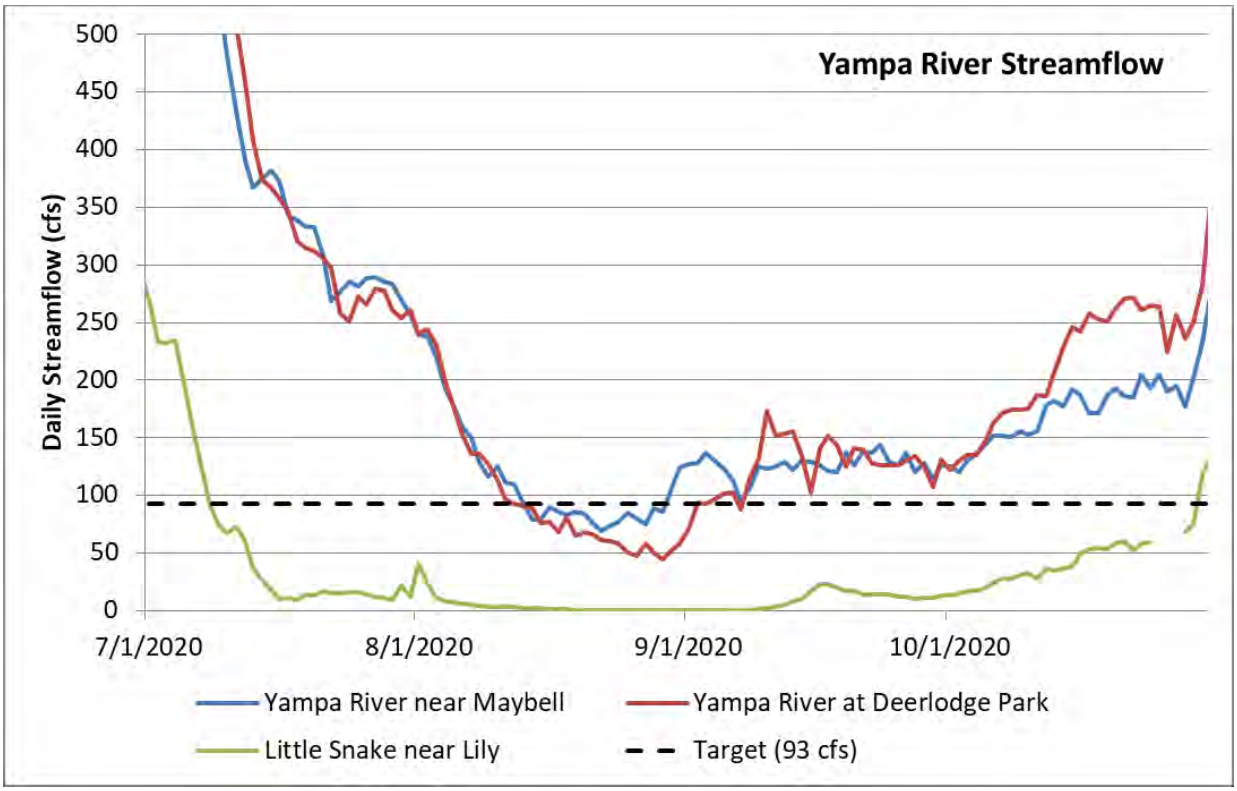


Figure 27: Yampa River Streamflow, July 1, 2020 through October 31, 2020

Key observations from Figure 27 are:

- Streamflow in July was sufficient to meet the Recovery Program target.
- The Maybell gage streamflow dropped below 134 cfs on August 8, 2020.
- The Deerlodge gage streamflow dropped below 134 cfs on August 9, 2020.
- The Maybell gage streamflow dropped below 93 cfs on August 14, 2020 and did not exceed 93 cfs until August 30, 2020.
- The Deerlodge gage streamflow dropped below 93 cfs on August 13, 2020 and did not exceed 93 cfs until September 4, 2020.
- During the extremely low flow period, the Little Snake River is dry.

Reservoir Operations

Elkhead Reservoir contents for 2020 are shown in Figure 28. The reservoir started the year with 19,440 acre-feet in storage, which is slightly higher than the 2007 through 2021 median value of 18,715 acre-feet. The reservoir reached its full capacity on May 2, 2020. The River District reported unusually high evaporation in May and June due to above normal temperatures and high winds.

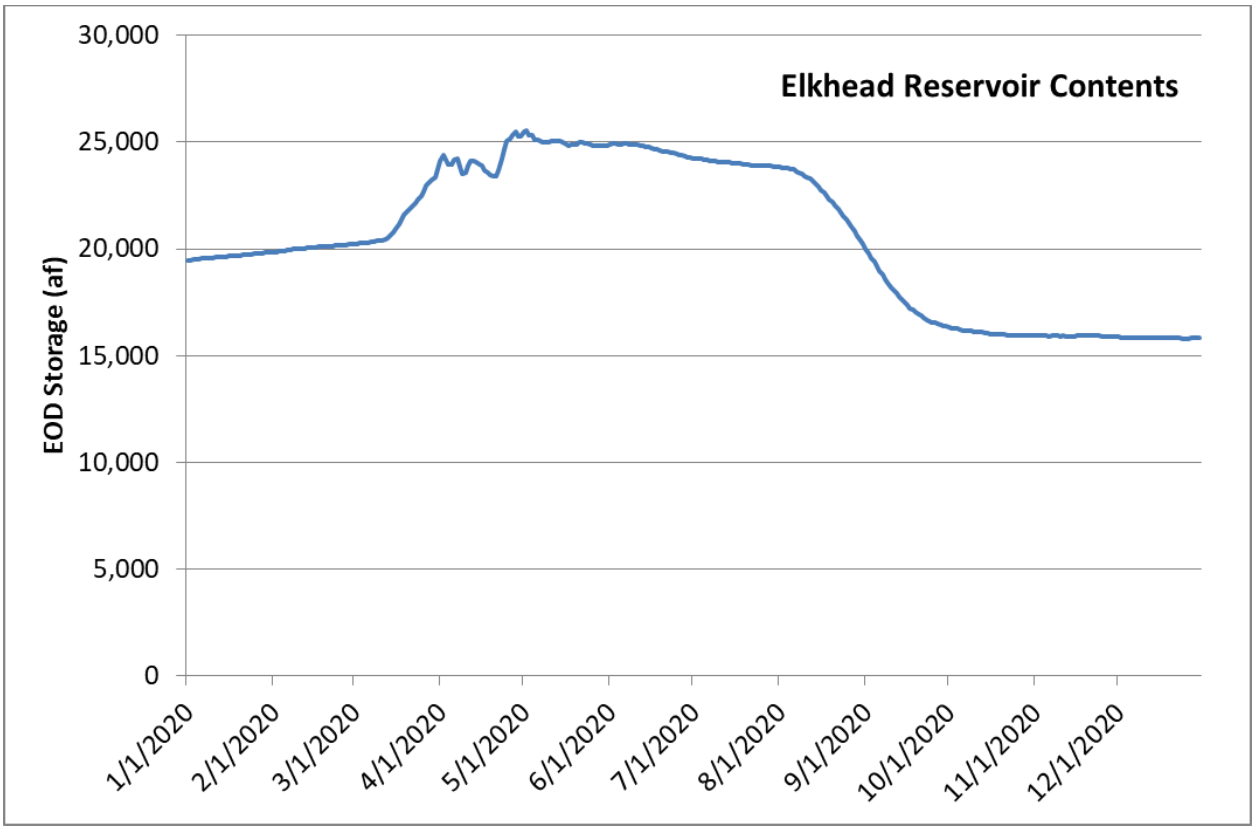


Figure 28: Elkhead Reservoir Contents (2020)

Figure 29 shows the reservoir releases by account and the end of day account storage contents. The CWCB pool (pink) was full with 5,000 acre-feet in storage at the beginning of August. The Recovery Program decided to lease 1,500 acre-feet of additional short term water supply from the River District. An additional 250 acre-feet was leased by the Colorado Water Trust. This resulted in a total of 1,750 acre-feet of water in the Lease Pool (green). Tri-State's pool in the enlargement (referred to as Tri-State 2 to distinguish from Tri-State's senior pool in the original Elkhead Reservoir) was full at the beginning of August 2,500 acre-feet (purple). The River District pool began with 2,707 acre-feet at the beginning of August (yellow).

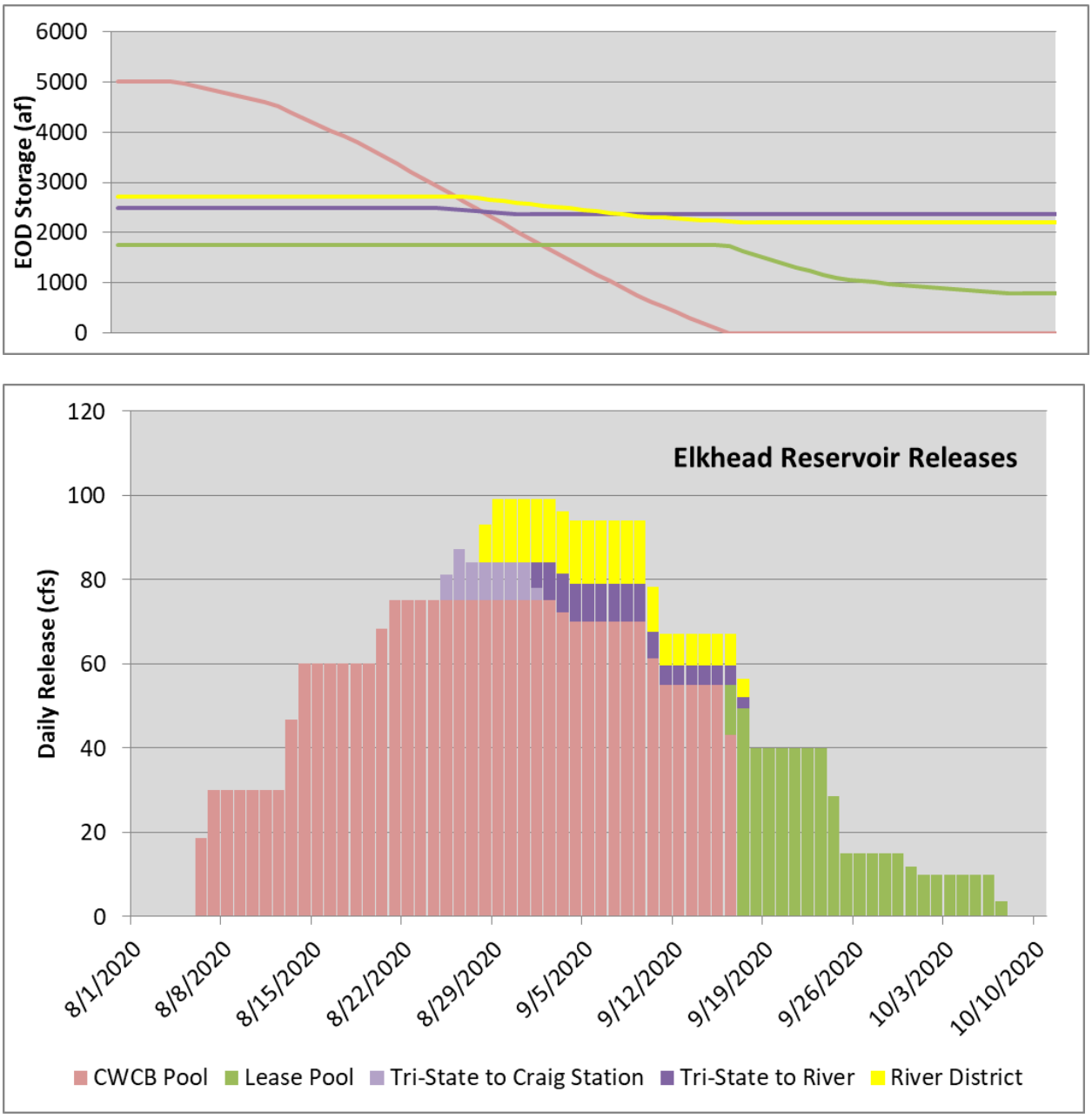


Figure 29: Elkhead Reservoir Pools and Releases, August 1 through October 10

Key observations from the graph are:

- The Recovery Program began releasing on August 6. Their initial rate was 30 cfs until August 13.
- The Recovery Program releases increased to 60 cfs on August 14.
- The Recovery Program again increased releases on August 20, reaching 75 cfs on August 21.
- Tri-State released to Craig Station from August 25 through September 1.
- Releases from Tri-State to the river occurred from September 1 through September 17.
- Releases from the River District pool occurred from August 28 through September 17.

- The 5,000 acre-feet in the CWCB pool was exhausted on September 16 and releases began from the Lease Pool.
- The maximum release from Elkhead Reservoir from all pools was 99 cfs for five days from August 29 through September 2.

Table 16 reports the annual release volumes by account and destination from Elkhead Reservoir. This is an annual summary of the data presented in Figure 29. In total 6,805 acre-feet were released from storage.

Table 16: 2020 Annual Release Volumes from Elkhead Reservoir

CWCB Pool Release (af)	Lease Pool Release (af)	Tri-State Release to Craig Station (af)	Tri-State Release to River (af)	River District Release to River(af)
5,000	952.8	131.8	226.2	494.2

Mainstem Call Administration

Generally, a water user requesting that a call be placed on the river must be able to "sweep the river", or divert the entire flow of the river. However, when Elkhead Reservoir is releasing water for the critical habitat reach, diversion structures must bypass the reservoir water. Therefore, for the Division Engineer to set a call, there must be insufficient natural flow in the river to satisfy the water right. This was the case in 2020. Starting on August 25, 2020, there was no natural flow in the Yampa River at the Deerlodge gage. Specifically, the Lily Park structures were beginning to divert reservoir release water due to a lack of native flow. The Division Engineer set the call at the Lily Park Ditch No. 1 (4400500). The call priority was set at Craig Station's water right, with a priority administration number of 37149, or September 17, 1951. On September 1 at 9am, the call priority was changed to May 10, 1963 at the Ellgen Ditch. This corresponded to the arrival of native flow at the Deerlodge gage. The call was released on September 3 at 11am.

Figure 30 and Figure 31 illustrate the sources of water in the Yampa River for the Maybell and Deerlodge gages. Transit loss and travel times are assumed to follow the Division of Water Resources standard procedures. DWR assesses a 0.16 percent per mile transit loss for the main stem of the Yampa River downstream of Stagecoach Reservoir. There are 73 river miles from Elkhead Reservoir to the Maybell gage and 114 miles to the Deerlodge gage. Therefore, the transit loss is 11.7% and 18.2%, respectively. DWR generally assumes a 48 hour travel time from Elkhead Reservoir to the Maybell gage and 120 hours to the Deerlodge gage. This is an important nuance in understanding how the Division Engineer protects Elkhead Reservoir releases through the Recovery Program's critical habitat reach.

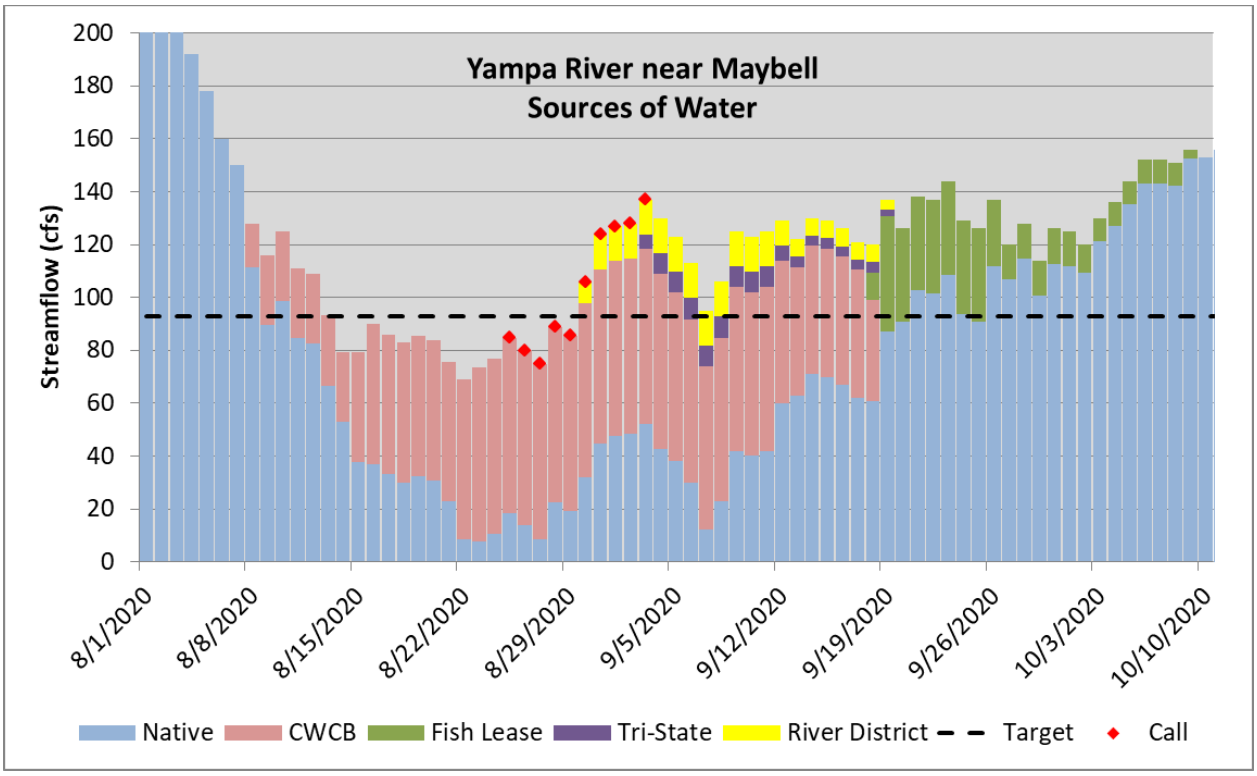


Figure 30: Sources of Water in the Yampa River near Maybell

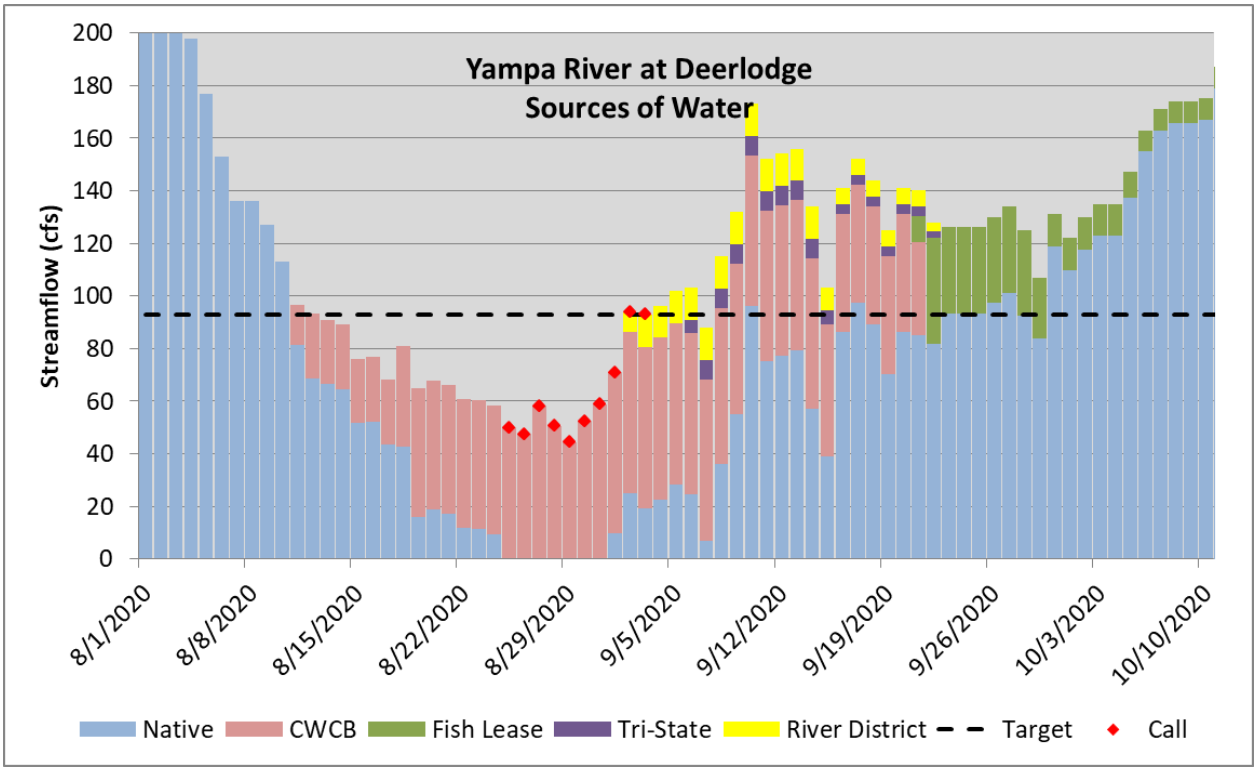


Figure 31: Sources of Water in the Yampa River at Deerlodge

Impacts of the Call

In order to put the impacts of the mainstem call into perspective, the relative priority of the calling water right was compared to absolute direct flow water rights throughout the basin. Figure 32 depicts the cumulative absolute diversion rights plotted by their administration number. Elkhead Reservoir original and enlargement storage priorities have been added for reference, but the graph does not plot storage rights.

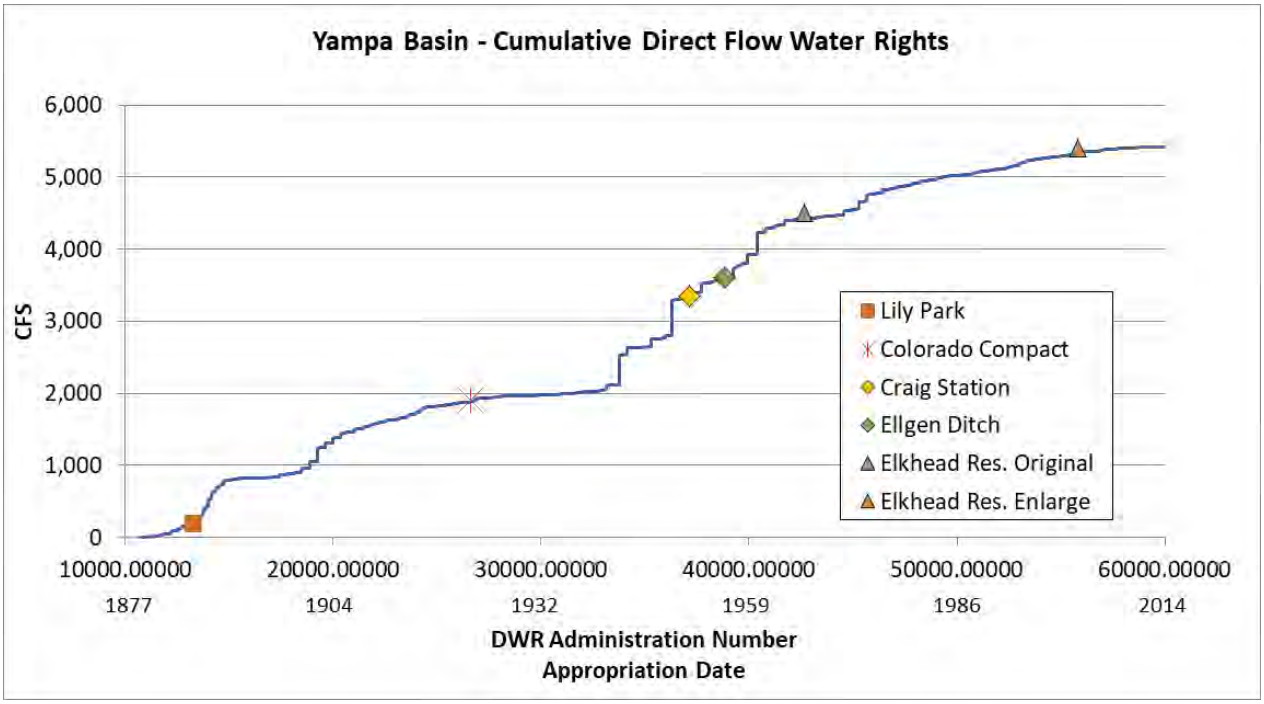


Figure 32: Yampa Basin Diversion Rights Graph

Key observations from Figure 32 are:

- Lily Park Ditch holds very senior water rights (April 10, 1886). However, the call priority on August 25 was administered with the Craig Station Priority (September 17, 1951).
- On September 1, the call priority was relaxed to the Ellgen Ditch priority of May 10, 1963.

Although mainstem calls in the Yampa Basin are relatively rare, some of the tributaries are regularly under administration. Figure 33 is a map showing the locations of the four other calls active on August 25, 2020. Figure 34 is a map prepared by the River District showing the diversion structures that were curtailed due to the Lily Park Ditch call on August 25. In Figure 35, the map highlights curtailed structures upstream of Hayden.

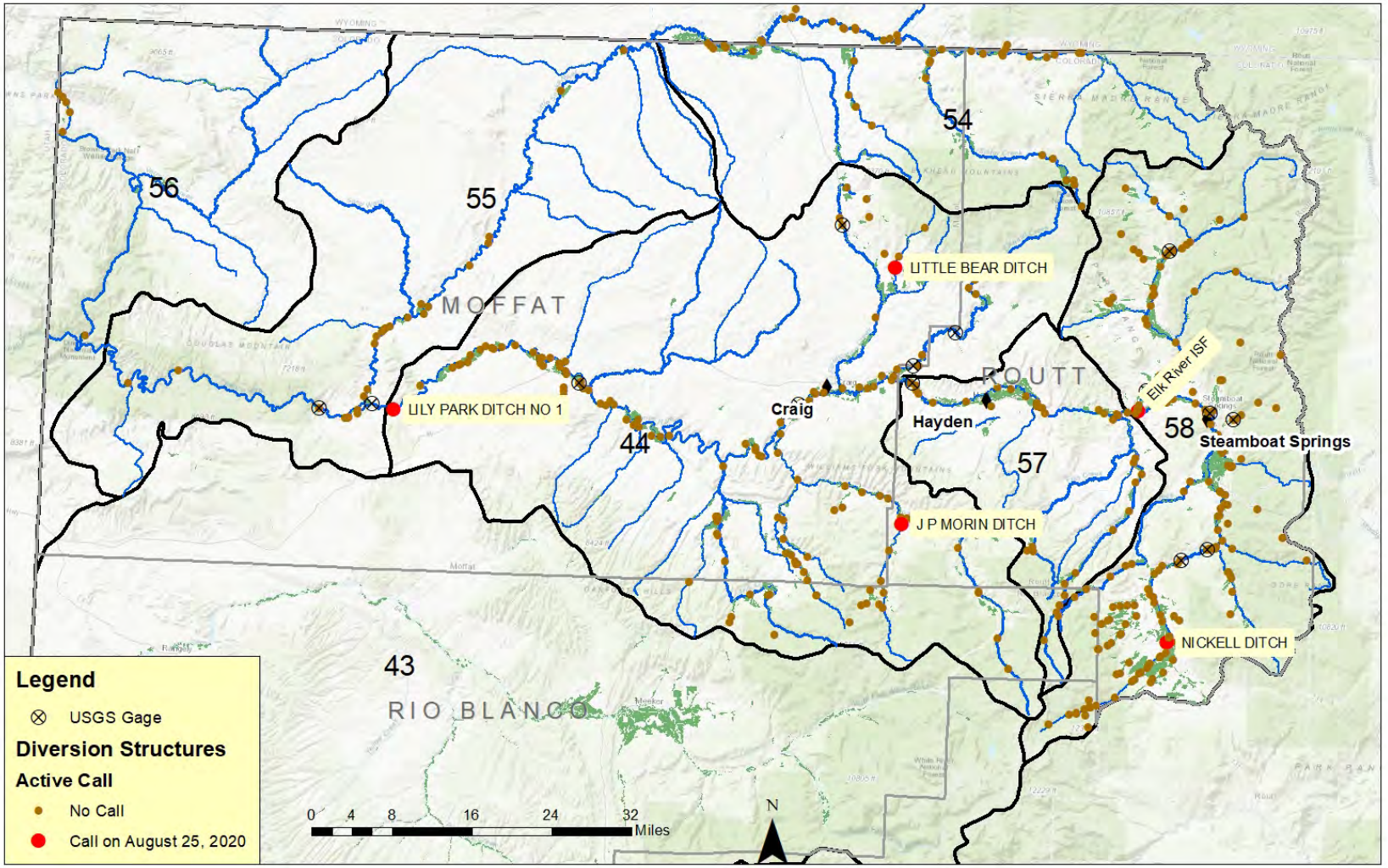


Figure 33: Map of calling structures on August 25, 2020.

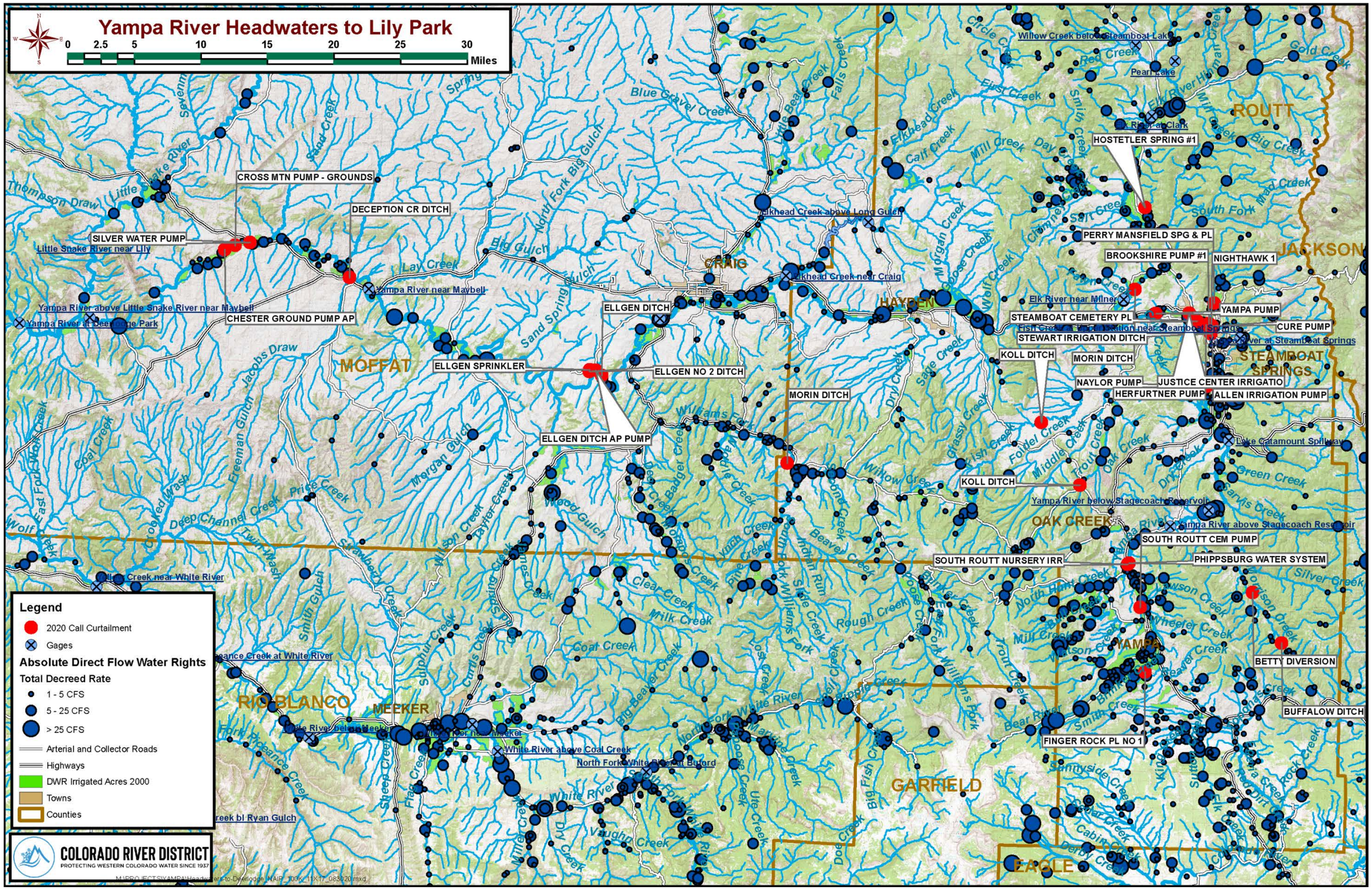


Figure 34: Map of Structures Impacted by the 2020 Lily Park Ditch Call - Full Basin

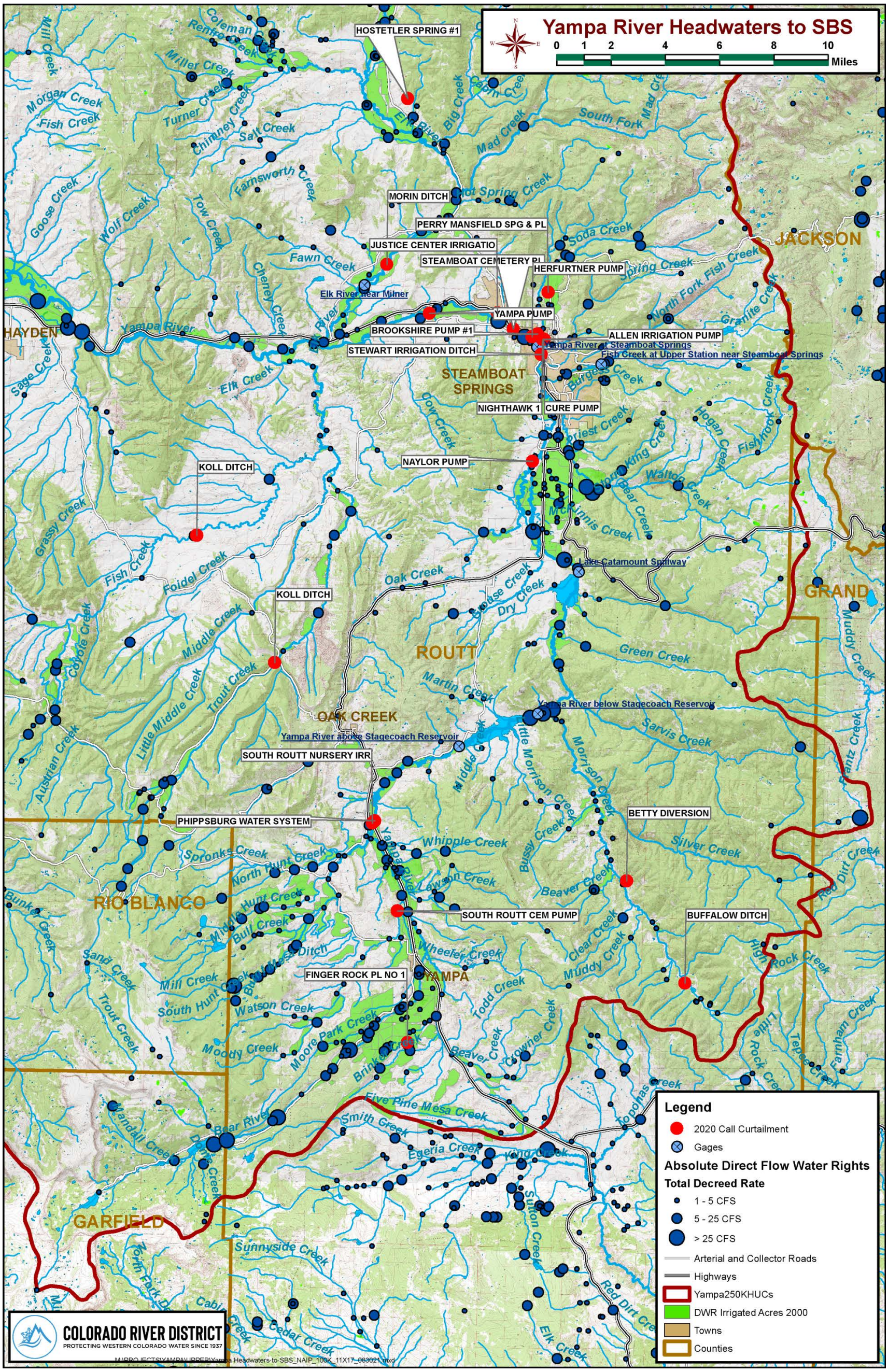


Figure 35: Map of Structures Impacted by the 2020 Lily Park Ditch Call - Upstream of Hayden

Key observations from the maps are:

- The Bear River, Elk River, Little Bear Creek, and South Fork of Williams Fork were already being administered for calls at local structures with various call priorities.
- The main stem call impacted diversion structures throughout the Yampa Basin. Actual impacts depended on the priority of the water rights and if the structure had been diverting prior to the call.

Alternative Recovery Program Operations

Despite the Recovery Program releases from Elkhead Reservoir, flow in the critical habitat dropped below the 93 cfs target. As shown in Figure 30, flows dropped below 93 cfs at the Maybell gage on August 14 and did not exceed 93 cfs until August 30, 2020. As shown in Figure 31, flows dropped below 93 cfs at the Deerlodge gage on August 13 and did not exceed 93 cfs until September 4, 2020. The flows dropped again on September 7. The Recovery Program ended the season with 797 acre-feet in the Lease Pool, prompting the questions "could the Recovery Program have released additional water in mid-August without running out of water in storage?

An additional 433 acre-feet of releases would have been necessary to achieve a 93 cfs streamflow target at the Maybell gage for every day from August 13 through August 29. However, this assumes that Elkhead Reservoir operators could have perfectly forecasted the amount of release needed to reach 93 cfs. The additional release requirements ranged from 3 cfs to 24 cfs, with a median of 12 cfs. A more realistic operational scenario could be an additional release of 25 cfs from Elkhead Reservoir during that period. This would have used and additional 793 acre-feet and resulted in 4 acre-feet remaining in the Lease Pool.

At the Deerlodge gage, an additional 1,387 acre-feet of releases would have been necessary to achieve a 93 cfs streamflow target for every day from August 13 through September 7. The additional release requirements ranged from 2 cfs to 49 cfs, with a median of 30 cfs. Even assuming perfect reservoir operations, the Recovery Program did not have enough water remaining in storage to fully meet the 93 cfs target.

The caveat to this analysis is that the Recovery Program does not have perfect knowledge of streamflows throughout the release season. The Recovery Program did not know that rainfall in mid-September would allow natural streamflows to rebound when they were making decision about releases in mid-August. The operators must balance current needs with potential future needs.

BOARD COMMUNICATION FORM

January 20, 2021 Board Meeting

From: Bob Weiss, Legal Counsel

Date: January 11, 2021

Item: Out of District Use of Water

X DIRECTION
X INFORMATION
MOTION
RESOLUTION

I. Request/Issue and Background Information: General Manager Rossi asked me to summarize. the law applicable to sale or other use of water stored in the District's reservoirs outside the boundaries of the District.

Water Conservancy Act: The powers of the Board of Directors of the District include the following:

37-45-118. General Powers. (1) The board has power on behalf of said district (emphasis added):

(b)(I)(B) To sell, lease, encumber, alien [sic], or otherwise dispose of water, waterworks, water rights, and sources of supply of water for use within the district;

. . . (j) To appropriate and otherwise acquire water and water rights within or without the state; . . . to provide, sell, lease, and deliver water for municipal and domestic purposes, irrigation, power, milling, manufacturing, mining, metallurgical, and any and all other beneficial uses and to derive revenue and benefits therefrom; . . . but the sale, leasing, and delivery of water for irrigation, domestic, and other beneficial purposes as provided in this section, whether the water is developed by the principal district or a subdistrict thereof, shall only be made for use within the boundaries of either the principal district or the subdistrict, or both.

§ 37-45-118(1)(b)(I)(B), -118(1)(j), 15 C.R.S. (1990).

However, there is a statutory exception to these provisions located outside the Water Conservancy Act (emphasis added):

Water conservancy districts and water conservation districts which own or hold rights to water may enter into cooperative agreements with other political subdivisions of the state for the lease or exchange of water produced in the exercise of such district's water rights

and the construction or use of waterworks within or outside of district boundaries, according to such terms as such district and political subdivision agree upon. Conservation districts, conservancy districts, and other political subdivisions of the state may enter into agreements with each other to provide funds or undertake measures to carry out section 37-45-118(1)(b)(II), including agreements for the exchange or lease of such water outside the boundaries of the conservation or conservancy district. Such leases and exchanges may cover the time period necessary to amortize, or repay bonds issued for, the cost of constructing the waterworks involved, and may be renewable according to such terms as such district and political subdivision may agree upon. Any water rights leased or exchanged under this section shall be only for the time certain contained in each such agreement or extension thereof. Any water rights or changes of water rights which are necessary to implement such agreements shall be adjudicated as provided by law. If mutually agreeable, districts and other political subdivisions may submit any contractual disputes arising under this section between them to nonbinding arbitration, as they may determine.

Colo. Rev. Stat. Ann. § 37-83-106 (West)

Thornton v. Bijou. In this regard the Colorado Supreme Court has stated in *Thornton v Bijou* (1996) that section 37-83-106, 15 C.R.S. (1990), allows water conservancy districts to enter into cooperative agreements with other political subdivisions for the lease or exchange of water outside of district boundaries under regulated conditions. These provisions certainly suggest that extra-district use is permissible under certain circumstances and, thus, not per se impermissible under the contract and statutes. However, in *Thornton* the Court found that other applicable agreements evidenced an intent to limit use of the water at issue within the District.

II. Summary and Alternatives: No action is requested in these matters. This discussion is informational. If the Board desires to discuss further or for me to research these matters further, please let me know.

III. Staff Recommendation: See II above.

IV. Legal Issues: Legal issues are identified in Section I above.

V. Consistency with Board Goals and Policies: No action proposed implicating District policies or goals.

VI. Fiscal Impact: Nothing impacting District finances is proposed.

Instream Flow

Prior Appropriation

Poudre Flow Plan

Competing Canals

Settlement

Prior Appropriation Adopted

FLOW RESTORATION IN COLORADO

poudr e Flows : a new legal paradigm

by Alyson Meyer Gould & Kate Ryan (Colorado Water Trust)
&
Casey Weaver, Colorado First Judicial District

Introduction

Conflict, born of scarcity, has shaped Colorado's system of water allocation and administration through much of its history. A dispute between water users on the Cache la Poudre River during the summer of 1874, in particular, played a significant role in the state's formal adoption of the doctrine of Prior Appropriation. Since then, as Colorado's population has grown over the years, more and more water has been withdrawn from Colorado's rivers through a complex system of water laws developed out of the Prior Appropriation doctrine, causing them at times to flow extremely low or go completely dry. This threatens fish, riparian habitat, and local economies that rely upon a flowing river. Now, one hundred forty-seven years later, a diverse group of stakeholders on the Cache la Poudre River are using a new legal tool to write the next chapter — a chapter aimed not at taking water from the river but, rather, restoring flow to the river when needed.

This article is the first in a two-part series about the Poudre Flows Instream Flow Augmentation Plan (Poudre Flows Plan).

The Poudre Flows Plan will be the first of its kind in Colorado and represents a new paradigm for flow restoration in Colorado. Part I of this article lays out the history of water use on the Cache la Poudre River and how such use helped shape Colorado water law. Part II discusses the flow restoration mechanisms that existed in Colorado prior to 2020 and explains how an instream flow augmentation plan differs from the other mechanisms. Finally, Part III provides an overview of the Poudre Flows Plan as it stands today.

I: The History of Colorado Water Law and the Role of Instream Flow Water Rights

To understand the role of instream flow water rights, it is important to understand where they fit in the history of Colorado water law. This history extends back over a century and can trace much of its development to competing interests in a river in north-central Colorado: the Cache La Poudre.

Conflict on the Cache La Poudre Gave Rise to New Water Laws

Between 1870 and 1871, irrigators from the Union Colony completed the construction of two canals diverting from the Cache la Poudre in the present-day Greeley area. Two years later, in 1873, the Fort Collins Agricultural Colony, located twenty-five miles upstream, completed two canals with a combined capacity capable of sweeping the river dry during periods of low flow.

Late in the summer the following year, the Fort Collins irrigators did just that, depriving the Greeley-area farmers of flows sufficient to irrigate their crops. The Union Colony decided to file for a perpetual injunction to bar the Fort Collins farmers from diverting to the injury of their earlier rights, and, upon learning of their intention, Fort Collins suggested a settlement conference. The Union Colony agreed, and the two parties met at a schoolhouse midway between the two towns.

At the conference, Fort Collins disagreed with the Union Colony's assertion that its earlier appropriation conferred a legal right to a reasonable portion of the river's water. Nonetheless, the parties agreed that Fort Collins would lower its headgates, allowing the foregone flow to reach the Greeley canals, in exchange for the Union Colony's suspension of the injunction. Though the Union Colony felt that Fort Collins breached the agreement, allowing less water to reach the Greeley canals than that upon which the parties had agreed, the controversy was temporarily quelled when, shortly thereafter, heavy rains soaked the area and broke the drought.

Two years later, the constitutional convention created a nine-member committee on irrigation, agriculture, and manufacture, which included two representatives from Weld County, within which Greeley is located, but none from the Fort Collins area. The committee recommended formal recognition of the doctrine of Prior Appropriation within the new state's constitution and the full convention heeded the suggestion.

Instream Flow Seniority

Legal Framework

Diversion & Beneficial Use

Instream Use

SB 97

Change of Use

SB 156

Preserve & Improve

Acquisition Funding

2013 Expansion

In particular, the constitution declared that the unappropriated water of the state is public property, subject to the people's appropriation and use. Though the relevant sections did not set forth a legal framework, they precluded holders of junior water rights — those appropriated after a given, competing right — from diverting water if to do so would "injure" a senior water right holder (i.e., prevent senior right holders from fully accessing their water allocation).

The General Assembly began constructing that legal framework with the adoption of the Adjudication Acts of 1879 and 1881. The Acts allowed water users to confirm their rights through judicial decree and charged state water officials with the administration of such rights. To establish a right, a water user had to demonstrate that they had diverted, or would divert, water from the stream and had applied, or would apply, that water to a beneficial use. The early laws only allowed water users to confirm irrigation rights.

The Adjudication Act of 1903 extended the system of formal water rights adjudication to all other beneficial uses. Because the courts understood the constitution as requiring a water user to demonstrate both: 1) that they had diverted water; and 2) that they had applied that water to beneficial use to establish a water right — the Act did not permit a water user to appropriate a right to keep water in a river or stream for the benefit of the natural environment (i.e., an instream flow right).

The Rise of Instream Flow Water Rights

Though Colorado's system of water rights adjudication and administration continued to develop and evolve, the diversion requirement remained in effect. That changed in the early 1970s. Buoyed by the broader environmental movement, the General Assembly passed Senate Bill (SB) 97 in 1973. SB 97 recognized the use of water for instream flow purposes and maintenance of natural lake levels as beneficial uses and granted the Colorado Water Conservation Board (CWCB) — a state agency housed within the Colorado Department of Natural Resources — the exclusive authority to appropriate and acquire instream flow and natural lake level rights "as required to preserve the natural environment to a reasonable degree." Shortly thereafter, the Colorado Supreme Court upheld the codified bill, finding that, by recognizing an instream flow right and creating a legal mechanism through which the CWCB could appropriate or acquire such a right, SB 97 did not violate the Colorado Constitution's diversion requirement. One hundred forty-one years after water users appropriated Colorado's earliest water rights on the Rio Grande River, SB 97 permitted the use of water, on behalf of the people, to preserve the natural environment.

Though SB 97 permitted the CWCB to both appropriate new instream flow rights and acquire and change previously established rights to instream flow use, the General Assembly did not initially appropriate funds for acquisitions. Consequently, the CWCB established the vast majority of its early instream flow rights as new appropriations. Those new appropriations were subject to administration within the established prior appropriation system, were junior to all previously established rights, and, due to their late priorities, had a limited impact in many cases. Recognizing that limited effect, the General Assembly has modified and expanded the means by which the CWCB, often in partnership with water users and third-party intermediaries, can use water for instream flow purposes. A few such modifications and expansions are particularly relevant to the Poudre Flows Plan.

The General Assembly adopted SB 156 in 2002. As noted previously, SB 97 authorized the CWCB to appropriate or acquire instream flow rights to preserve the natural environment to a reasonable degree. SB 97 required the CWCB, in conjunction with Colorado Parks and Wildlife (CPW) (then, the Departments of Wildlife and of Parks and Outdoor Recreation), to determine the flow rate necessary to preserve the natural environment to a reasonable degree and capped the quantity that the CWCB could appropriate or acquire at that flow rate. SB 156 expanded the CWCB's authority, permitting it to acquire water rights and change them to instream flow purposes in quantities to preserve or improve the natural environment to a reasonable degree. SB 156, in those situations in which the CWCB had the opportunity to acquire water rights, allowed it to use an instream flow right to produce a more profound and lasting positive effect.

In 2008, the General Assembly bolstered the CWCB's ability to acquire water rights for subsequent change to instream flow use. As noted above, the General Assembly did not, in passing either SB 97 in 1973 or any subsequent legislation, allocate funds for the CWCB's acquisition of water rights. Thus, the CWCB had to rely on donations to acquire senior rights administered with early priorities. This limited the instream flow program's impact because, on many impacted rivers and streams, the CWCB was left to appropriate junior rights and could not exercise those rights against senior diversions.

In passing House Bill (HB) 08-1346, the General Assembly allocated funds to the CWCB for the acquisition of water rights. Specifically, the Bill allocated $1,000,000 per year from the CWCB's Construction Fund for such use. Notably, HB 1346 limited expenditures to acquisitions that would preserve the natural environment to a reasonable degree. Reversing course, however, the General Assembly amended the codified section in 2013 with the passage of Senate Bill 181, permitting the CWCB to use the allocated funds for acquisitions to improve the natural environment as well.

Instream Flow

Augmentation for Instream Flow

Finally, amidst the pandemic, in 2020, the General Assembly passed House Bill 1037. Relevantly here, HB 1037 confirmed that the CWCB could create augmentation plans for instream flow use. Acting pursuant to HB 1037, the CWCB now has the authority to operate permanent stream restoration plans in the form of Instream Flow Augmentation Plans. The passage of these bills will allow for an Instream Flow Augmentation Plan on rivers like the Cache La Poudre, helping to sustain fish and wildlife habitat, while also protecting other water users from injury to their water rights.

II: Distinguishing Instream Augmentation Plans from Other Legal Tools that Restore Streamflow

In order to illustrate how the various permanent streamflow restoration mechanisms work, consider a simplified example of a fictional stream. Assume a stream having a flow of 10 **c**ubic **f**eet per **s**econd (cfs) with two diversions. The first is a senior diversion with a priority date of 1900 for 2 cfs. The second is a diversion with a priority date of 1950 for 4 cfs. Finally, for the sake of simplicity, disregard return flow and transit losses in all of the following examples.

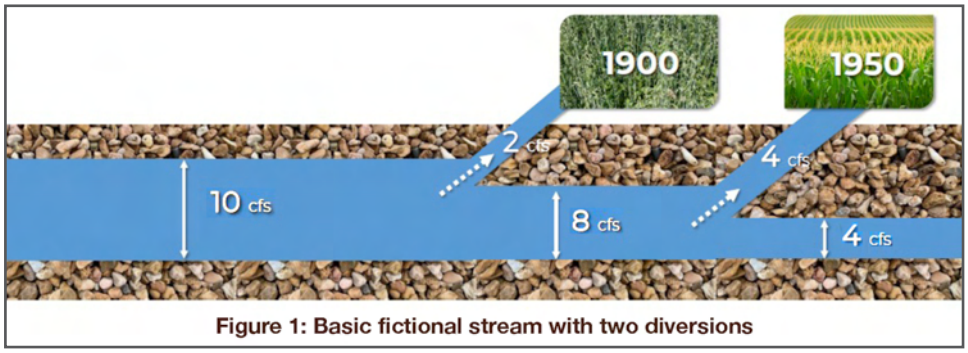


Figure 1: Basic fictional stream with two diversions

Instream Flow Impact

Now consider the impact of a new appropriation for instream flow use on this stream. As a new appropriation, this water right takes on a priority based on the date that the CWCB filed a water court application to have the water right adjudicated. As discussed in Part 1, Colorado law did not recognize instream flow as a beneficial use until 70 years after recognizing all the other beneficial uses. As such, an appropriated instream flow water right with a priority date of 1980 is relatively common. On the fictional stream described above, consider an appropriated instream flow of 4 cfs at the top of the reach with a priority date of 1980. That water right could protect some streamflow from future junior diversions, but, because it is junior to the other downstream diversions, 1.7 cfs of the 4 cfs decreed to it would be diverted along the reach.

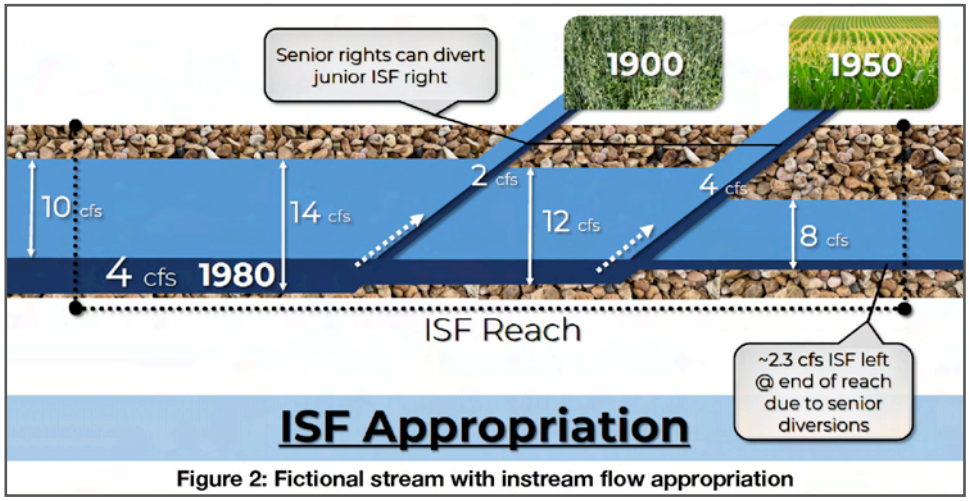


Figure 2: Fictional stream with instream flow appropriation

Changing Existing Right

Senior Protection

Next, consider the impact that would result if the CWCB were to acquire an existing water right and gain approval to change its use to instream flow. The water court process would impose terms and conditions on the CWCB's use of the water right, but the right would maintain its original priority date. Assume that a senior water right decreed in 1890 and upstream of the other two water rights on the fictional stream is changed to instream flow use. After the water court places terms and conditions on the CWCB's use of the acquired water right for instream flow, a rate of 4 cfs is allocated to the changed water right. Because it is senior to the other diversions, the entire 4 cfs is protected from diversion as it flows down the entire fictional stream.

Instream Flow

Protection from Diversion

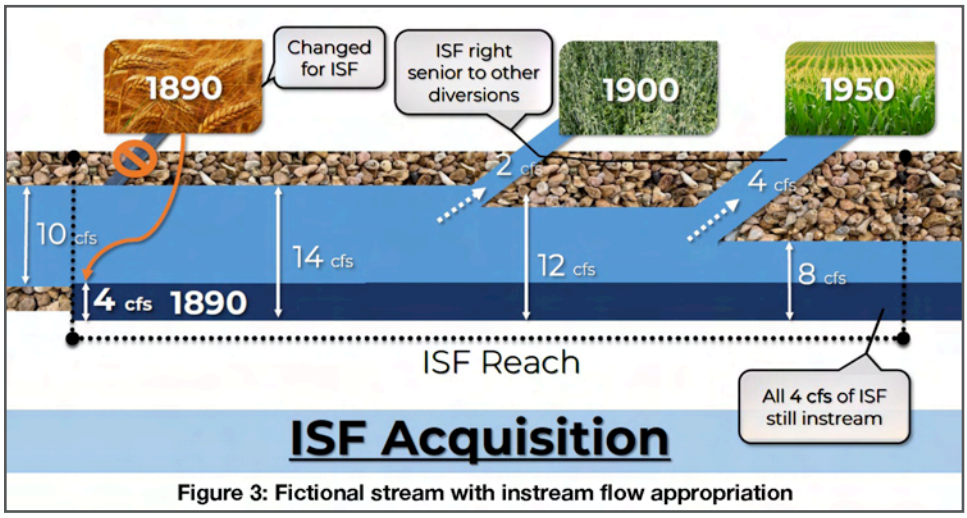


Figure 3: Fictional stream with instream flow appropriation

Acquired Instream Flows

Within Colorado, acquired instream flows are far less common than appropriated instream flows. According to the authors' estimate, they only make up about 3% of the instream flow rights in the state. While the CWCB can acquire senior rights on either a permanent basis (via purchase or donation), or on a temporary basis (via lease or loan), opportunities for protecting streamflow in this manner are sparse in certain areas. Neither acquired nor appropriated instream flow water rights are likely to achieve streamflow restoration goals on Colorado's larger and harder working rivers, many of which were overapprioriated early in the 1900s, as municipal, industrial, and agricultural diversions flooded the water courts. Recognizing this, Colorado water users have begun contemplating plans for appropriation to achieve streamflow restoration goals in recent years.

Traditional Augmentation Plan

Generally speaking, a traditional augmentation plan is a court-approved method for water users to replace out-of-priority diversions in time, location, and quantity, thereby preventing injury to other water rights. An augmentation plan is operated by strategically increasing the supply of water available for beneficial uses in a reach of stream within which other, more senior rights' full appropriation of the streamsflow precludes water users from appropriating new rights. On the fictional 10 cfs stream, for instance, imagine that a junior water user comes in and diverts 8 cfs upstream of the two more senior rights. If that diversion were not curtailed, the 1950 priority would not get water and the stream would dry up below the 1900 priority's 2 cfs diversion point. Alternately, the two senior diversions would curtail a 2022 water user seeking an 8 cfs diversion and would prevent it from adjudicating a water right in water court due to lack of water availability.

Instream Flow Augmentation Plan

An instream flow augmentation plan ("section 4.5" augmentation plan), as opposed to a traditional augmentation plan, is another type of augmentation plan in Colorado. The remainder of the section distinguishes a traditional augmentation plan from an instream flow augmentation plan. A "section 4.5" augmentation plan refers to C.R.S. § 37-92-102(4.5), which is the type of instream flow augmentation plan established by HB 1037 and used by Poudre Flows.

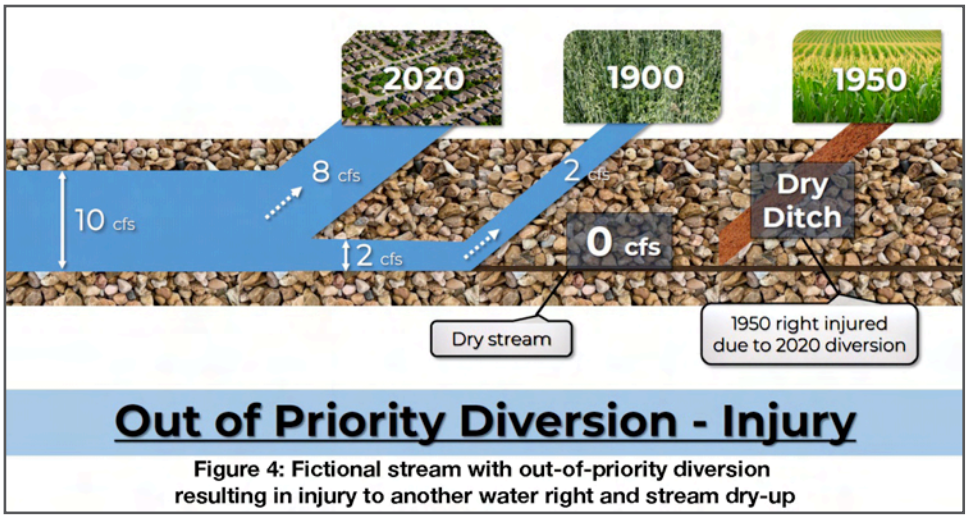


Figure 4: Fictional stream with out-of-priority diversion resulting in injury to another water right and stream dry-up

Instream Flow

New User

Stored Water

There is a path forward, however, for a new 2022 water user, i.e., a new junior appropriator. The new user can simply increase the supply of water available for its beneficial uses, thereby supporting the appropriation of a new water right. The 2022 water user could augment streamflow by introducing additional flow from a water right decreed for augmentation purposes. There are multiple potential sources of augmentation water, including senior rights acquired and changed for that purpose. In this case, consider augmentation water in the form of an upstream reservoir release. The 2022 water user secures a right to add an additional 4 cfs of stored water to the stream, which is enough flow to ensure that the 1950 priority can divert its full right. Note, however, that although the 1950 priority is no longer injured, the stream still dries up. This outcome is logical because the law neither requires, nor provides an incentive for, the 2022 water user to introduce more water to the stream than is necessary to prevent injury to other water rights. Even if it did, it could not prevent another water user from diverting the additional water out of the stream.

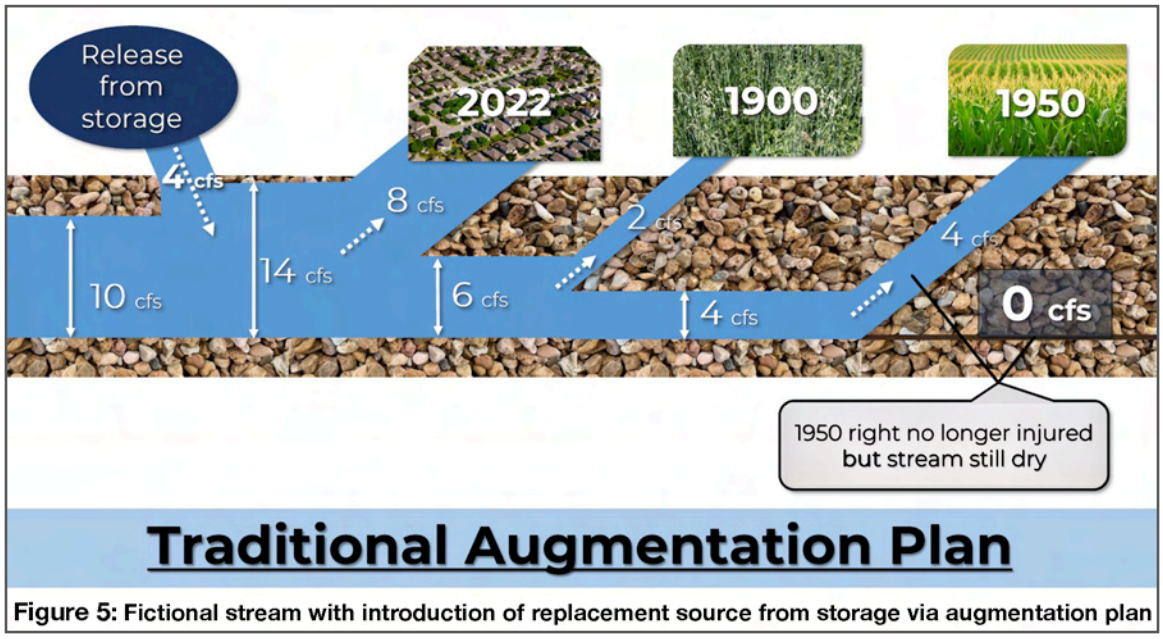


Figure 5: Fictional stream with introduction of replacement source from storage via augmentation plan

Instream Flow Augmentation Guideposts

From the 1980s through 2020, traditional augmentation plans proved to be a valuable tool for newer water users on over-appropriated stream systems. In 2020, a coalition of northern Colorado water users, together with the Colorado Water Trust and the CWCB, worked with then-State Representative Jennifer Arndt (D) and Senator Donald Coram (R) to secure passage of legislation that confirmed the use of augmentation water for instream flow purposes (HB 1037). The legislation established four guideposts for plans that provide for augmentation of instream flow:

First, the Bill permits the CWCB to create plans that produce rates of flow sufficient to both preserve and improve the natural environment to a reasonable degree. As noted above, the CWCB similarly has the authority to acquire and change water rights to instream flow use at quantities sufficient to both preserve and improve the natural environment to a reasonable degree but can appropriate new rights only in quantities sufficient to preserve such flows.

Second, for the CWCB to include a source of replacement water in a section 4.5 instream flow augmentation plan, a water court must have already quantified the replacement source and changed it to augmentation use. The owner of the replacement supply must consent to use of the water right in the plan. Once the plan is decreed, the CWCB can add additional sources of replacement water, as with a traditional augmentation plan.

Third, the instream flow augmentation plan cannot cause injury to other decreed water rights or administratively approved exchanges. The underlying decrees that changed and quantified the seed water remain in full force and effect, and the water court can add additional terms and conditions if those in place will not prevent injury.

Fourth, the augmentation plan proponent must pay for the modification of any existing diversion structure needed to operate the instream flow augmentation plan and the structure owner must agree to the modification.

Instream Flow

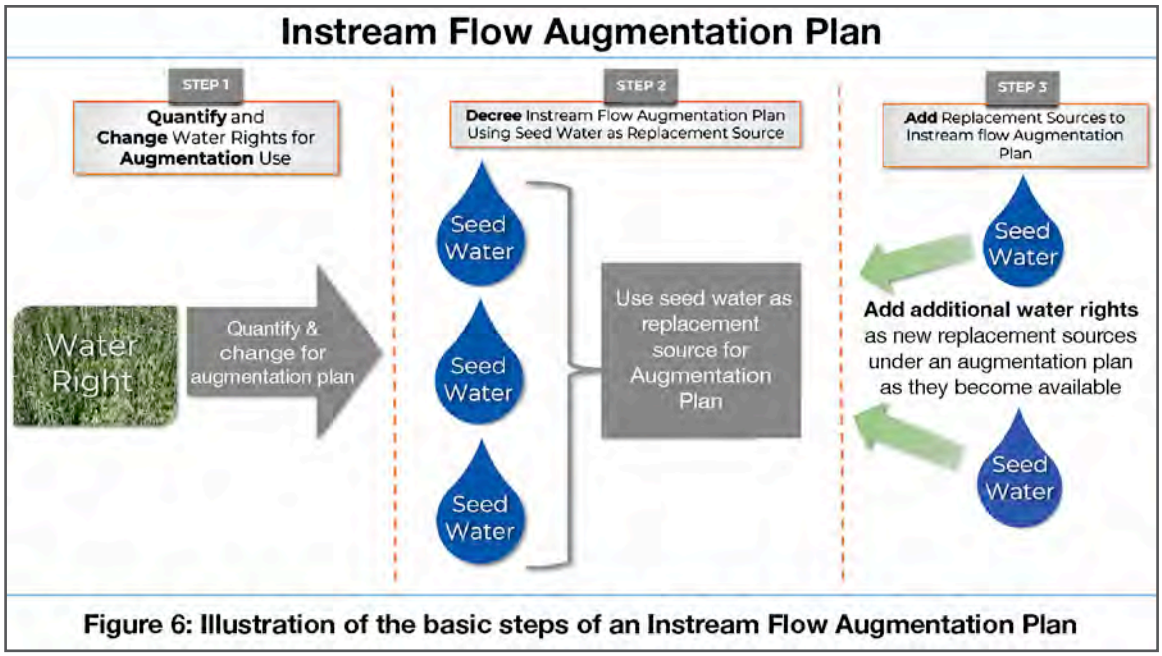


Figure 6: Illustration of the basic steps of an Instream Flow Augmentation Plan

Downstream Use

In light of the legislation, we can now consider how the addition of augmentation water for flow augmentation purposes would affect the fictional stream discussed above. Assume replacement water of 4 cfs added to the fictional stream at the top of a geographic reach is identified for instream flow augmentation. That water flows through the reach without being diverted by the senior water rights. Though similar to the acquired instream flow example above, the water added at the top of the reach is decreed for augmentation, rather than for instream flow use. This example is also similar to a traditional augmentation plan. However, the water added to the stream *remains instream* boosting flows through the entire reach. As in the example of a traditional augmentation plan, if the replacement water is appropriately decreed, it can be reused for different purposes downstream of the reach in which it augments streamflow.

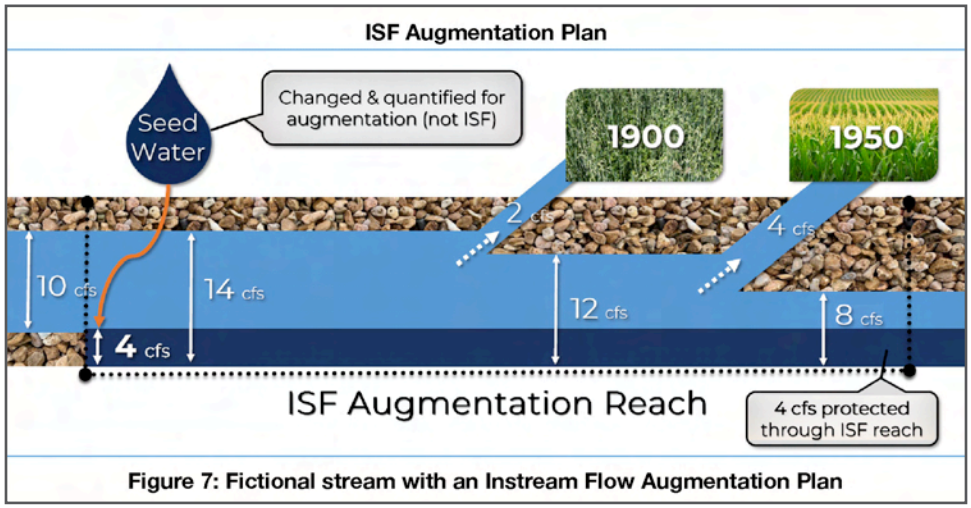


Figure 7: Fictional stream with an Instream Flow Augmentation Plan

III: Instream Flow Augmentation Plans in Practice

First Plan

Poudre River

As alluded to above, the first-ever plan for augmentation of instream flow is currently being developed in northern Colorado on the Cache la Poudre River. The Poudre River runs west from its headwaters in Rocky Mountain National Park through the Roosevelt National Forest toward Colorado's eastern plains within Water Division 1. This is a well-populated and fast-growing area, home to centennial agricultural production and the cities of Fort Collins and Greeley. Water Division 1 is also the jurisdiction of one of the state's busiest water courts and complex water rights administration crisscrossed by ultra-senior diversions, transbasin water deliveries, and a web of exchanges and traditional plans for augmentation. The Poudre River falls steeply through the Cache la Poudre Canyon where flows include CWCB instream flow appropriations and federal Wild and Scenic River administration protected flows. At the mouth of the Poudre Canyon, the river slows as it hits the plains, before continuing another 57-miles east to its confluence with the South Platte River.

Instream Flow

"Dry-Up" Locations

Study/Action Group

Local Support

Poudre Flows Cooperation

MOA for Group Structure

Streamflow Analysis

Seed Water

"Float on the Bottom"

Development Phase

This 57-mile stretch of the Poudre River epitomizes the concepts of a "hard working river" and "the lifeblood" of several Colorado communities. Much of the flow of the Poudre River is used outside of the channel resulting in reduced flow and even dewatering within the channel. There are six "dry-up" locations where the entirety of the streambed is regularly exposed due to historic diversions for storage, agricultural, municipal, and industrial uses. Downstream of such uses, river flows rebuild across the seasons, as return flows reach the channel.

As noted above, conflicts on the Poudre River gave rise to some of Colorado's first water laws. So, perhaps it is fitting that the first instream flow augmentation plan is also planned for the Poudre River. However, instead of arising out of conflict, this time the innovation resulted from cooperation. The hard working 57-mile stretch of the Poudre River has had neither sufficient water availability nor benefited from the political will to support an instream flow appropriation by the CWCB. Nevertheless, local water users and stakeholders have persisted in searching for a solution to support both healthy flows and the consumptive uses that the Poudre River provides. Over the past decade, the Poudre Runs Through It Study/Action Group (Group), convened by Colorado State University on behalf of local water users, has worked toward that goal. Around 2016, the Group began consulting with the Colorado Water Trust, a statewide nonprofit that aims to restore flows to Colorado's rivers in need. These entities began strategizing to develop a plan for augmentation of instream flow and gathered support from local water users to pursue the plan.

A diverse group of entities with varied interests has cooperated to form the Poudre Flows partnership. That diversity has been important to the concept as the partnership has, from the start, sought to represent a cross-section of interests on the hard-working Poudre River. The cities of Greeley, Fort Collins, and Thornton are fiscal contributors and will supply the seed water rights to the plan for augmentation. Cache la Poudre Water Users Association is a group that represents local ditch and irrigation companies, providing valuable logistical support. Northern Water Conservancy District, which supplies native and transbasin water via the Colorado-Big Thompson Project to northern Colorado water users, provides both logistical and financial support. Two state entities are involved: Colorado Parks and Wildlife (the environmental need experts); and the CWCB, which will hold the instream flow water right. Finally, the Colorado Water Trust serves as the fiscal agent, fundraiser, and project facilitator, and engaged Spronk Water Engineering for technical services on behalf of the group. The parties have all contributed and agreed to a Memorandum of Agreement (MOA) to govern how the Poudre Flows group will function now and in the future. (The MOA is at page 126, etc. of the CWCB's Board packet dated November 18–19, 2020, available at: https://dnrweblink.state.co.us/cwcb/0/edoc/213402/23%20PF%20AugPlan1stMtg%20Memo%20w%20Exhs.pdf).

Planning for the Poudre Flows Plan for augmentation began with an analysis of streamflow in the river and how it could be optimized. The analysis required the parties to answer four basic questions:

First, what is the flow now? The Poudre Flows project has examined flows along the entire 57-mile reach, including variability across different locations and throughout the year. Gage data helped to address this question.

Second, what flow do the fish need to survive and thrive? This analysis is the purview of Colorado Parks and Wildlife scientists who calculate the "preserve" and "improve" flow rates for river segments that the CWCB can use for water acquisitions in an instream flow augmentation plan.

Third, what is the difference between today's flows and ideal fish flows?

Fourth, can the seed water make up at least some of this difference?

Addressing each of these questions together, the plan for augmentation aims to add the seed water to the stream when it is available and needed to boost flow to preserve or improve the environment. Seed water consists of augmentation supplies that are new to contemporary river flows, having derived from sources that historically have been diverted and from which water courts have approved fully consumable replacement rates and volumes. The seed water will augment flows that would have otherwise been in the Poudre River, without interfering with the senior diversions, exchanges, and operations that have historically supported water users. In effect, the augmentation supplies will "float on the bottom" of the river — protected from diversion, reconnecting dry-up locations, and boosting flows without interfering with the hard-working nature of the river that people depend on.

There has been and will continue to be a lengthy and robust project development and judicial process to achieve the Poudre Flows plan for augmentation of instream flow.

First, there was the development phase, which included:

- some serious out-of-the-box thinking
- significant fundraising
- two years' worth of legislative lobbying and statutory approval
- the parties' drafting of and agreement to the formulative memorandum of agreement
- preliminary engineering
- the outreach essential to community support

Instream Flow

Adminstrative Approval

Implementation

Following the development phase, the Poudre Flows partners sought administrative approval from the CWCB. State law required the partners to gain the agency's approval to acquire a right to use the seed water rights in the plan and for the partners to file an application with the water court. After gaining the CWCB's approval, the plan will proceed before the Division 1 Water Judge just like a traditional augmentation plan. After approval on paper, the partners will coordinate annual operations and long-term planning, including ongoing investments to facilitate the passage of augmentation water downstream. Finally, the partners will be able to add additional sources of replacement water to the augmentation plan, commensurate with approval form the CWCB and Colorado's State Engineer.

With that, you may be asking where is the Poudre Flows project at now? It received CWCB approval in January 2021 and the partners filed the water court application in April 2021. Part II of this series on the Poudre Flows Plan is forthcoming, pending the Division 1 Water Court's approval.

Conclusion

History

Let's review. Colorado's system of prior appropriation arose largely out of necessity to address competing interests. Since 1874, more and more water has been diverted for beneficial use causing some rivers to have low flows and in some cases, go completely dry. Instream flow water rights were recognized as a beneficial use fairly late, resulting in a relatively junior status as compared to other types of water uses. Colorado's instream flow program has evolved over the course of its 40-year history, with the latest development coming amid the pandemic in the form of instream flow augmentation plans.

Plans' Benefits

Instream flow augmentation plans are distinct from the other types of permanent flow restoration mechanisms. These include instream flow appropriations, which tend to be relatively junior; instream flow acquisitions, which are fairly rare; and traditional augmentation plans, which are not designed to benefit instream flow. Instream flow augmentation plans, on the other hand, are specifically designed to benefit instream flow, taking advantage of the benefits of acquired instream flows, but with more flexibility and capability for adaptation.

The first-ever instream flow augmentation plan, the Poudre Flows Plan, is now pending before the Division 1 Water Court. It is a plan borne of innovation and collaboration of a diverse group of partners and designed for a hard-working river vital for the health of the environment and the livelihood of many water users who rely upon its flows. Part II of this series on the Poudre Flows Plan will follow the Water Court's issuance of a decree for the plan.

For additional information:

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colorado Water trust Website: http://coloradowatertrust.org

Alyson Meyer Gould, Esq. Alyson is Staff Attorney and Director of Policy for the Colorado Water Trust. She was born and raised in Colorado and after earning her B.S. in Biology from Bucknell University, Alyson returned to Colorado to pursue law. Alyson earned her J.D. and an LL.M. from the University of Denver. Before joining the Colorado Water Trust, Alyson was in private practice, focusing on the representation of water districts, contractors, and water rights owners.

Kate Ryan, Esq. Kate is Senior Staff Attorney and Program Director for the Colorado Water Trust. She joined the Water Trust in 2019, with over a decade of experience practicing Colorado water law. Her past clients included farmers, ranchers, municipalities, landowners, the CWCB, and the Water Trust itself. Before going to Berkeley Law she obtained a master's degree in geography at the University of Colorado and worked as an associate scientist at the National Snow and Ice Data Center.

Casey Weaver, Esq. Originally from Carbondale, Colorado, Casey attended, and recently graduated from law school at the University of Denver. While in law school, he interned with the Water Court for Water Division No. 5, Denver Water, the Colorado Water Trust, and the Colorado Office of the Attorney General's Natural Resources and Environment section, and served on the editorial staff of the University of Denver Water Law Review and the Denver Law Review. Casey is currently serving as law clerk for the Honorable Jason D. Carrithers of Colorado's First Judicial District.

BOARD COMMUNICATION FORM

From: Andy Rossi, General Manager

Date: 10/11/22

Item: 2023 Upper Yampa Water Conservancy District (UYWCD) Strategic Plan and Proposed New Work Efforts

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_X_ DIRECTION
___ INFORMATION
___ MOTION
___ RESOLUTION

I. Request/Issue and Background Information:

An update on the proposed new UYWCD work tasks for 2023 is presented for consideration by the UYWCD Board of Directors (BOD).

II. Summary and Alternatives:

The UYWCD Strategic Plan is to be reviewed by the UYWCD BOD and staff, as a point of reference in the development of the annual UYWCD budget. The goals and objectives articulated in the Work Plan are to serve as guidance for the allocation of UYWCD funds and staff time. Furthermore, the UYWCD Strategic Plan is intended to be a living document that may require updates as the goals of the UYWCD and needs of the Yampa River Basin water users change over time.

The 2022 Strategic plan was referenced as the foundational document for the development of the 2023 UYWCD Budget and 2023 UYWCD Work Plan updates. Both the 2023 UYWCD Budget and Strategic Plan updates will be prominent topics for discussion during the October 19, 2022, UYWCD BOD Retreat. In July of 2022, the UYWCD BOD and staff adopted following schedule for the update of the UYWCD Work Plan and annual budget for 2023:

1. **COMPLETED TASK**- August 15, 2022: UYWCD BOD Special Meeting held to review the 2022 work plan progress and solicit input from the UYWCD BOD on new and continued work efforts to be consider for inclusion in the 2023 UYWCD Budget.
2. **COMPLETED TASK** -September 22, 2022, regular BOD Meeting: First DRAFT of the 2023 UYWCD Annual Budget is presented along with list of recommended new work efforts for 2023. List of new work efforts compiled from UYWCD staff and BOD input received since August 15, 2022.

3. **CURRENT TASK** - October 19, 2022, UYWCD BOD Retreat: UYWCD Work Plan update discussion with full UYWCD BOD, including input received to date. Direction provided by UYWCD BOD will be incorporated into new DRAFT of 2023 UYWCD Work Plan and Budget. All new work efforts will be referenced to the UYWCD Strategic Plan objectives.
4. **FINAL TASK** - November 16, 2022, Regular UYWCD BOD Meeting: Present final DRAFT of 2023 UYWCD Budget for adoption by UYWCD BOD.

The **CURRENT TASK** in the planning process includes the final consideration of the proposed new work efforts for inclusion in the 2023 Budget. A list of the proposed new tasks with estimated associated costs is included with this communication. The final determination of the full extent of resources required to successfully complete all new work efforts in 2023 will be developed following discussions during the UYWCD BOD Retreat on October 19, 2022.

No edits and/or updates to the UYWCD Strategic Plan are recommended by the UYWCD BOD and/or staff for 2023. The UYWCD Strategic Plan and Objectives included in the plan will continue to serve as guidance for organizational efforts through 2023. The UYWCD Strategic Plan will used as a reference during discussions of this item.

III. Staff Recommendation:

Finalized direction for new work plan items to be included in the 2023 UYWCD Budget to be presented for adoption by UYWCD BOD at the November 16, 2022, meeting.

IV. Legal Issues:

NA

V. Consistency with Board Goals and Policies:

UYWCD Strategic Plan 10.2

Attachments:

New Work Plan Items Proposed for inclusion in the 2023 UYWCD Budget

New Work Plan Items Proposed for Inclusion in the 2023 UYWCD Budget

UYWCD SP Goal	New/Continued 2023 Work Effort	Notes and Details	Personnel	Estimated Cost/Funding	Potential for Outside Grant(s) Funding	Included in Draft UYWCD 2023 Budget
6.1	Yampa River StateMod Improvements	IWMP Recommendation. Bear River reach model refinements completed by UYWCD in 2022. Remainder of Yampa River system refinements being completed by WWG for CWCB. Return flow model process improvements possible, see description of Return flow study.	GM, District Engineer, Engineering Consultant(s)	$25,000	Yes	Yes (PLN)
6.1	Return Flow Study	IWMP Recommendation. UYWCD Staff and TU have been working with WWG to gain a better understanding of the potential to use StateMod as an analytical tool for a return flow timing and contribution study. After extensive discussions, the work group has a much better understanding of the limitations of return flow analytics in StateMod. The most likely recommended return flow study configuration will include a combination of StateMod analytics coupled with isotopic water sampling efforts.	GM, District Engineer, Basin Partners, Engineering Consultant(s)	$50,000	Yes	Yes (PLN)
6.1, 5.2, 7.3	UYWCD Operations Dashboard, Yampa River Dashboard	IWMP Recommendation. The UYWCD is currently working with LRE to build and deploy an operations dashboard for UYWCD staff only use. The UYWCD proprietary dashboard will serve as the foundation and framework for a Yampa River System information dashboard for public access and use.	GM, District Engineer, Basin Partners, Engineering Consultant(s)	$25,000	Yes	Yes (PLN)
2.1, 2.2, 7.2	Upper Yampa River Water Quality/Algae Study	IWMP Recommendation. Two-year plan of work for upper basin WQ/Algae study completed in 2022. Initial funding for WQ study efforts provided by UYWCD, CRD, and CWCB (pending). UYWCD retained WQ consultant (LRE) to track current Lake and Reservoir Nutrient Standards regulatory process. UYWCD formal response to regulatory process TBD pending final schedule of CDPHE hearings/process. First DRAFT of subject specific educational content is complete. NASA DEVLOP Satellite Imagery Algae Detection study complete (final report pending).	GM, District Engineer, Basin Partners, Engineering Consultant(s)	$60,000	Yes ($50,000 Awarded in 2022)	Yes ($10,000, PLN, $50,000 will be Pass-through)
6.2	Soil Moisture Network	Upper Yampa River Basin site location analysis for new deployment of Soil Moisture Senor Network complete. First new Soil Moisture Monitoring Station installation complete. Continued efforts to include UYWCD support of full build out of soil moisture monitoring capacity at existing Yampa Basin NRCS SNOTEL sites. Additional new monitoring station construction TBD pending siting priorities and logistics. New flow forecast model capabilities to be derived from addition of new data streams with existing inputs. Forecast Model information gathering conducted late 2022.	GM, District Engineer, Basin Partners, Engineering Consultant(s)	$80,000	Yes	Yes (PLN)
7.1, 7.3	Headwaters Forest Fire Vulnerability Study	The CWCB Wildfire Ready Watersheds program is conducting a State-wide Wildfire Susceptibility Analysis. The Yampa River Basin susceptibility analysis data can be used in combination with existing basin GIS data to direct the UYWCD in support Forest and Headwaters protection efforts.	GM, District Engineer, State Agency, Engineering Consultant(s)	$25,000	Yes	Yes (PLN)
4.4, 4.7	Coal Creek and Bear River Monitoring Stations	The UYWCD will solicit USFS approval for the installation of multiple environmental data monitoring sites in the Bear River area of the Routt National Forest. This effort is a sequential step in the consideration of the Coal Creek Diversion Project. Regardless of the ultimate UYWCD decision for Coal Creek Diversion, the installation of the proposed monitoring sites will improve the water resource management of the Bear River reach.	GM, District Engineer, Engineering Consultant(s)	$15,000	NA	Yes (PLN)
4.4, 4.7	Morrison Creek Diversion	Use LRE updated study as basis for systematic analysis of the Little Morrison Creek/Morrison Creek Upper Diversion Project.	GM, District Engineer, Engineering Consultant(s)	$20,000	NA	Yes (PLN)
4.4, 4.7, 5.2	Reservoir Release Coordination	IWMP Recommendation. The UYWCD will continue Yampa River Basin Coordinated Reservoir Release discussions with the ultimate goal of producing a "handbook" of coordinated reservoir release mechanisms that may be deployed in response to varied hydrologic conditions. Special topic for discussion at UYWCD BOD Retreat, October 19, 2022.	GM, District Engineer, Basin Partners	UYWCD Staff Time	NA	Yes
4.1, 4.5	Municipal Water Needs Analysis Grant Program	New grant program specifically for municipal water needs assessment studies. Full discussion of this concept will be conducted during UYWCD BO Retreat on October 19, 2022.	UYWCD Staff, Legal Counsel	UYWCD Staff Time. Approved Funds Allocation	NA	No
4.1, 4.5	Large Infrastructure Project Loan Program	UYWCD ability/legal authority for financial loan activities TBD pending advice from outside legal counsel.	UYWCD Staff, Legal Counsel	UYWCD Staff Time, Outside Legal Counsel TBD	NA	No
1.1	Colorado River Compact Administration Policy Statement	Begin development of UYWCD formal policy statement on potential Colorado River compact administration practices. UYWCD GM to participate in lower Colorado River Basin tour November 2022. Initial policy statement recommendations to be presented for discussion in early 2023.	UYWCD Staff, UYWCD BOD, Legal Counsel, Basin (Yampa and Colorado) Partners	UYWCD Staff Time	Yes	Yes
4.1	UYWCD Internship Program	New intern position at UYWCD. Intern to provide support for external affairs and public outreach efforts as primary work focus. Additional support of UYWCD efforts TBD.	UYWCD Staff	TBD, Pending UYWCD BOD Direction	NA	No

UPPER YAMPA WATER
CONSERVANCY DISTRICT

BOARD COMMUNICATION FORM

From: Andy Rossi, General Manager

Date: 10/10/22

Item: Yampa River Basin Water User Financial Support Options

_____ DIRECTION
__X__ INFORMATION
_____ MOTION
_____ RESOLUTION

I. Request/Issue and Background Information:

The Upper Yampa Water Conservancy District (UYWCD) has considered multiple options for providing financial assistance to Yampa River basin water users for various purposes. The UYWCD staff and Board of Directors will discuss options for the continuation of this financial assistance. Supporting information will be provided by the UYWCD General Council.

II. Summary and Alternatives:

The UYWCD current water user financial assistance programs include:

- Formal Grant Programs target at Specific Infrastructure Upgrades (DIIP: Measuring Devices, Headgates)
- Individual/One-Time Grants on an as-needed basis for largescale water infrastructure projects (Sheriff Reservoir/Oak Creek)
- Formal Grant Program for basin water planning and outreach efforts (Community Grants: RCCD, Yampatika)

The UYWCD is considering the following new financial assistance programs:

- Large Infrastructure Loan Program
- Municipal Water Needs Analysis Grant Program
- Others?

III. Staff Recommendation:

Review legal authorizations/capabilities to develop new financial assistance programs with UYWCD General Counsel before proceeding with and proposed new program development.

UPPER YAMPA WATER
CONSERVANCY DISTRICT

IV. Legal Issues:

The UYWCD General Counsel will discuss the information gathered from research conducted on the subject matter.

V. Consistency with Board Goals and Policies:

UYWCD SP Objective 4.1, 4.5

Attachments: Memorandum from General Counsel Weiss

Memorandum

October 19, 2022

From: Bob Weiss, Legal Counsel

Date: October 10, 2022

Item: District Lending Authority

X DIRECTION
X INFORMATION
_____ MOTION
_____ RESOLUTION

Background

At a recent Upper Yampa Water Conservancy District (UWCD) Board of Directors meeting the suggestion was made that the UYWCD consider creating a loan program to help finance the water projects of governmental entities within the UYWCD or certain private entities such as ditch companies. One of the issues identified was the UYWCD's legal authority to make such loans.

I agreed to consult with a bond attorney with expertise in this area. In September, Director Sharp, General Manager Rossi, and I spoke to Dee Wisor at Butler Snow, who is a very experienced bond attorney. In general Mr. Wisor pointed out several provisions within the Water Conservancy Act and elsewhere which he believes give the UYWCD "abundant legal authority for the UYWCD to cooperate with other governments on water projects." Mr. Wisor mentioned in our call that he assisted the Northern District in the financing of the Windy Gap firming project. Some of these statutory provisions are attached with this memorandum for reference. Such transactions might not be structured as traditional loans but could involve the UYWCD financing projects and being repaid over time either in an annually appropriated lease-purchase agreement or by some other mechanism.

Before proceeding further, Legal Counsel and staff recommends that the UYWCD Board discuss in concept whether it is interested in pursuing such a program and give appropriate direction to staff.

APPLICABLE STATUTES

C.R.S. § 37-45-118 (1) The board has power on behalf of said district:

(I) (A) To take by appropriation, grant, purchase, bequest, devise, or lease, and to hold and enjoy water, waterworks, water rights, and sources of water supply, and any and all real and personal property of any kind within or without the district necessary or convenient to the full exercise of its powers;

(B) To sell, lease, encumber, alien, or otherwise dispose of water, waterworks, water rights, and sources of supply of water for use within the district;

(j) To appropriate and otherwise acquire water and water rights within or without the state; to develop, store, and transport water; to subscribe for, purchase, and acquire stock in canal companies, water companies, and water users' associations; to provide, sell, lease, and deliver water for municipal and domestic purposes, irrigation, power, milling, manufacturing, mining, metallurgical, and any and all other beneficial uses and to derive revenue and benefits therefrom; to fix the terms and rates therefor; and to make and adopt plans for and to acquire, construct, operate, and maintain dams, reservoirs, canals, conduits, pipelines, tunnels, power plants, and any and all works, facilities, improvements, and property necessary or convenient therefor and, in the doing of all of said things, to obligate itself and execute and perform such obligations according to the tenor thereof; but the sale, leasing, and delivery of water for irrigation, domestic, and other beneficial purposes as provided in this section, whether the water is developed by the principal district or a subdistrict thereof, shall only be made for use within the boundaries of either the principal district or the subdistrict, or both;.

C.R.S. § 37-45-131. Sale of water by contract

The board may sell, lease, or otherwise dispose of the use of water or capacity in works by term contracts or by contracts for the perpetual use of the water or works to public corporations, districts, as that term is defined in section 37-45.1-102(1), utilities, persons, mutual ditch companies, water users' associations, and other private corporations for irrigation, domestic, municipal, industrial, commercial, or other authorized uses as provided by contracts, in writing, authorized and entered into by the board. The board shall require that security be given to secure the payments to be made under the contracts, which security may include the security specified in section 37-45-132 or such other security as the board determines to be appropriate. The contracts may include the contractual provisions specified in section 31-35-402(1)(h) as determined by the board.

C.R.S. § 31-35-402 (1) (h) To enter into and perform contracts and agreements with other municipalities for or concerning the planning, construction, lease, or other acquisition and the financing of water facilities or sewerage facilities or both and the maintenance and operation thereof. Pursuant to any such contracts or agreements, such municipalities may obligate themselves to make payments in amounts which shall be sufficient to enable any municipality which finances such water facilities or sewerage facilities or both to meet its expenses, the interest and principal payments for its bonds, its reasonable reserves for debt service, operation and maintenance, and renewals and replacements, and the requirements of any rate covenant with respect to debt service coverage contained in any resolution, ordinance, or other security instrument. Such contracts or agreements may contain such other terms and conditions as the municipalities may determine, including but not limited to provisions whereby a municipality is obligated to pay for the output, capacity, or use of any project irrespective of whether such output, capacity, or use is produced or delivered to the municipality or whether any project contemplated by any such agreement is completed, operable, or operating, and notwithstanding suspension, interruption, interference, reduction, or curtailment of the output, use, or service of such project. Subject to local charter and state constitutional limitations, such contracts or agreements may also provide that if one or more of the municipalities default in the payment of its obligations under any such contract or agreement, the remaining municipalities which also have such agreements shall be required to accept and pay for, and shall be entitled proportionately to use or otherwise dispose of, the output, capacity, or use of the project contracted for by the defaulting municipalities. The obligations of a municipality under such contracts or agreements shall either constitute special obligations of the municipality, payable solely from the revenues and other moneys derived by the municipality from its water facilities, sewerage facilities, or both, and shall be treated as expenses of operating such facilities or, in the discretion of such municipality and subject to satisfaction of any requirements of law governing or limiting the incurrence of debt by such municipality, shall constitute a general obligation of such municipality. Notwithstanding the provisions of section 6 (3) of article XI of the state constitution, where such contract or agreement is to constitute a general obligation of such municipality and where such contract or agreement provides that the municipality shall be required to accept and pay for the output, capacity, or use of the project contracted for by a defaulting municipality, such contract or agreement shall not be entered into unless the question of incurring a general obligation for such project has been submitted to and approved at an election conducted by such municipality in accordance with the election laws applicable to such municipality. Any such municipalities so contracting may also provide in any contract or agreement for a board, commission, or such other body as they deem proper for the supervision and general management of the water facilities or sewerage facilities or both and for the operation thereof and may prescribe its powers and duties, including the power to issue revenue bonds pursuant to this part 4, and fix the compensation of the members thereof. For the purposes of this paragraph (h), "municipality" means a municipality as defined in part 1 of article 1 of this title and any other political subdivision of this state, including any entity formed pursuant to intergovernmental contract or agreement, authorized by any law of this state to acquire, operate, and maintain the facilities which are the subject of such contract or agreement.

This statute defines municipality as "(4) 'Municipality' means a municipality as defined in part 1 of article 1 of this title and includes any quasi-municipal corporation formed principally to acquire, operate, and maintain water facilities or sewerage facilities or both."

C.R.S. § 29-1-203. Government may cooperate or contract - contents

(1) Governments may cooperate or contract with one another to provide any function, service, or facility lawfully authorized to each of the cooperating or contracting units, including the sharing of costs, the imposition of taxes, or the incurring of debt, only if such cooperation or contracts are authorized by each party thereto with the approval of its legislative body or other authority having the power to so approve. Any such contract providing for the sharing of costs or the imposition of taxes may be entered into for any period, notwithstanding any provision of law limiting the length of any financial contracts or obligations of governments.

(2) Any such contract shall set forth fully the purposes, powers, rights, obligations, and the responsibilities, financial and otherwise, of the contracting parties.

(3) Where other provisions of law provide requirements for special types of intergovernmental contracting or cooperation, those special provisions shall control.

(4) Any such contract may provide for the joint exercise of the function, service, or facility, including the establishment of a separate legal entity to do so.

UPPER YAMPA WATER
CONSERVANCY DISTRICT

BOARD COMMUNICATION FORM

From: Karina Craig

Date: 10/19/22

Item: Upper Yampa Water Conservancy District Tax Discussion

_____ DIRECTION
__X__ INFORMATION
_____ MOTION
_____ RESOLUTION

I. Request/Issue and Background Information:

Approximately 70% of the Upper Yampa Water Conservancy District (UYWCD) annual revenues come from the UYWCD's 1.82 mill property tax levy. The purpose of this item is to give the UYWCD Board of Directors an opportunity to discuss the implications to the UYWCD and its finances that may occur as a result of changes to UYWCD property tax revenues occurring over the next few years.

II. Summary and Alternatives:

The State of Colorado establishes the parameters for valuation and taxation of Real, Personal, State Assessed and Natural Resources Property. The UYWCD levies taxes on certain Real, State Assessed and Natural Resources Property.

Real Properties valuations and corresponding collections are on a cycle that generally encompasses 5.5 years, with the first day of a 24-month property valuation period starting on July 1 of year 0, and the resulting accrued collections ending on December 31 of year 5.

- For Routt and Moffat counties, a 24-month long valuation period of Real Property started on July 1, 2020 and ended on June 30, 2022. The resulting valuations are the basis for December 2023 and 2024 mill levy certifications and 2024 - 2025 fiscal year property tax collections. 2023 is a reassessment year and 2024 is an intervening year. **2020 to 2022 property values determine 2024-2025 fiscal years property tax collections.**
- For Routt and Moffat counties the 24-month long valuation period of Real Property started on July 1, 2022 and will end on June 30, 2024. The resulting valuations will be the basis for December 2025 and 2026 mill levy certifications and 2026 - 2027 fiscal year collections. 2025 is a reassessment year and 2026 is an intervening year. **2022 to 2024 property values determine 2026-2027 fiscal years property tax collections.**

State Assessed and **Natural Resources Property** are valued annually, and valuation is based on the prior year's income and the price of the production and the property.

The UYWCD preliminary 2023 budget draft currently includes:

- 2023 UYWCD total tax collections based on preliminary valuations are approximately 70% of annual UYWCD revenues.
- Tax levies are a significant funding source for UYWCD facilities.

A Memorandum detailing the UYWCD's Mill Levy and Tax Valuation process, including preliminary estimates for UYWCD Revenue Sources by Property Classification for 2023, and some expected changes to UYWCD tax revenues in the near future is attached with this communication.

III. Staff Recommendation:

NA

IV. Legal Issues: Compliance with Budget statutory requirements per Colorado Revised Statutes (C.R.S. 29-1-105, C.R.S. 29-1-106 (1), C.R.S. 29-1-108 (2) and (3), C.R.S. 39-5-128(1) and C.R.S. 29-1-113(1).

V. Consistency with Board Goals and Policies: UYWCD By-Laws and Strategic Plan Objective 3.

Attachments:

Attachment 1: Memorandum on Upper Yampa Water Conservancy District Tax Discussion.

UPPER YAMPA WATER
CONSERVANCY DISTRICT

MEMORANDUM

From: Karina Craig, Accountant, and Andy Rossi, General Manager

Date: October 19, 2022

Item: **Upper Yampa Water Conservancy District Property Tax Discussion**

_____ DIRECTION
__X__ INFORMATION
_____ MOTION
_____ RESOLUTION

Background

Approximately 70% of the Upper Yampa Water Conservancy District (UYWCD) annual revenues come from the UYWCD's 1.82 mill property tax levy. The purpose of this memorandum is to give the UYWCD Board of Directors an opportunity to discuss the implications to the UYWCD and its finances that may occur as a result of changes to UYWCD property tax revenues occurring over the next few years.

The Taxpayer's Bill of Rights

The Taxpayer's Bill of Rights (TABOR) is an amendment to the Constitution of the State of Colorado that was approved by voters in 1992. It contains tax spending, revenue and debt limitations which apply to the State of Colorado and all local governments, with certain exceptions.

TABOR requires advance voter approval for any new tax, tax rate increase and mill levy above that from the prior year. TABOR establishes a cap formula where the revenue limit is approximately equal to the prior fiscal year's limit plus the rate of inflation and population growth. It also requires that excess revenue be refunded to taxpayers.

"Debrucing" Across Colorado

TABOR applies to all governments and taxing districts in Colorado, no matter how big or small. With caps and inflation adjustments effecting limits on revenues independent of growing economic demands, exception from certain TABOR provisions can be appealing to constituencies. The question of either eliminating or changing the revenue cap has been presented voters numerous times.

The name of the individual who championed TABOR in 1992 was Doug *Bruce*. Therefore, the term "debrucing" refers to the act of eliminating the revenue cap, allowing a government to retain and use all the revenue it collects.

Many Colorado counties, municipalities, school districts and local governments are now "debruced." **The UYWCD "debruced" in 1999**.

Assessment Rates and Gallagher Amendment

Colorado real estate property tax rates, or the mechanism to calculate them, were historically determined by the State Constitution.

The assessment rate for both residential and non-residential property prior to 1982 was 30%. In the 1970s, Colorado experienced a period of rapid demographic growth along with increasing residential values and property taxes. In response to these changes, the Gallagher Amendment passed in 1982.

The purpose of the Gallagher Amendment was to stabilize the tax burden on residential property. This constitutional amendment also simplified the methodology to assess property values, eliminated certain nuisance taxes, and it set a fixed ratio of 45:55 for the residential to non-residential tax base ratio.

Assessors reported all taxable property within their county boundaries to the Administrator, at the Division of Property Division, in the Department of Local Affairs (DOLA). Based on this report, the DOLA Administrator proposed a Residential Assessment Rate (RAR) tax rate to the Colorado General Assembly.

The Gallagher Amendment functioned like a balancing scale. The fixed 45:55 contribution ratio meant that when residential values went up, or when non-residential values went down, or when both occurred, the RAR went down.

Over the years that followed the Gallagher amendment, the rising residential property values outpaced the growth of value of other property types. Eventually, residential property made up 80% of the total assessed value of all property statewide. Thus, while the non-residential rate was 29% in 2020, the residential property tax rate had changed from 21% in 1982 to 7.15% in 2020.

Within the frame of the 45:55 Gallagher ratio, the combination of increased residential and decreased non-residential values resulted in the DOLA Administrator forecasting a proposed RAR of 5.88% to the Colorado General Assembly for the 2021 reassessment year.

This RAR of 5.88% would have represented an 18% loss of property tax revenues for the 2022-2023 fiscal years. As dictated by the State Constitution the multimillion-dollar shortfall would have to be partially backfilled by the state, further exacerbating the decrease in state revenues caused by the pandemic.

In 2020 state legislators approved a ballot initiative to repeal the Gallagher Amendment, proposing to initially maintain the 7.15% and 29% residential and non-residential rates, respectively. The repeal also established that there would be no assessment rates in the State Constitution, but solely by statutes. Voters passed the repeal.

In recent years, rates were established for a two-year period and modified only a year later, in response to changing economic conditions. A summary of assessment rates for real property as proposed by the DOLA Administrator and as currently established through various Senate Bills for collection years 2023 through 2026 is provided in **Table 2**.

UPPER YAMPA WATER
CONSERVANCY DISTRICT

Table 2

Property Tax Assessment Rate Changes pursuant to SB22-238
May 3, 2022

Type of Property		Assessment Rates – For property tax years 2022 (payable in 2023) Created under SB21-293	Assessment Rates – For property tax year 2023 (payable in 2024) Created under SB22-238	Assessment Rates – For property tax year 2024 (payable in 2025) Created under SB22-238	Assessment Rates – For property tax year 2025 (payable in 2026) & thereafter
Non-residential	Hotels, motels and B &Bs – 'lodging properties'	29%	27.9% (Exempt first $30,000 of Actual Value)	29%	29%
	Renewable Energy Production	26.4%	26.4%	26.4%	29%
	Agricultural Property	26.4%	26.4%	26.4%	29%
	Commercial, Vacant, Industry	29%	27.9% (Exempt first $30,000 of Actual Value)	29%	29%
	Oil & Gas	87.5%	87.5%	87.5%	87.5%
Residential	Multi-family housing (i.e. apartments)	6.80%	6.765% (Exempt first $15,000 of Actual Value)	6.8%	7.15%
	All other residential property	6.95%	6.765% (Exempt first $15,000 of Actual Value)	TBD (set at a level to hit a total revenue reduction over the 2023 & 2024 property tax years of $700 million)	7.15%

Backfill for Property Tax Year 2023 & 2024 (3 tiers):

1.) Local governments in counties with over 300,000 people will be made whole for 65% of their lost revenue.
9 counties: Adams, Arapahoe, Boulder, Denver, Douglas, El Paso, Jefferson, Larimer and Weld

2.) Local governments in counties with a.) under 300,000 people and b.) an assessed valuation growth of over 10% will be made whole for 90% of their lost revenue.
10 counties: Chaffee, Eagle, Elbert, Grand, Gunnison, Lake, Montrose, Park, San Miguel and Summit

3.) Local governments in counties with a.) under 300,000 and b.) an assessed valuation growth of under 10% will be made whole for 100% of their lost revenue.
Remaining 45 counties

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CONSERVANCY DISTRICT

Property Tax Calculations in Practice

Tax calculations for real property consist of several components including:

- Property Classification
- Actual value of the property
- Assessment Rate
- Assessed Value
- Tax Rate (mill levy)

When analyzing tax revenues in aggregate, assessment rates, mill levies, property valuation cycles and trends, are factors to consider.

UYWCD Tax Levies

New tax levies are established for individual taxing authorities through approval from voters at public elections.

A Tax Levy is the amount of dollars per $1,000 of valuation for assessed property.

A mill is 1/10 of one cent, or $1 of revenue for each $1,000 of assessed property.

Every year, taxing authorities determine the revenue needed and allowed under the law to provide services the following year. Mill levies are certified accordingly, every December.

The UYWCD's mill levy history is shown in **Table 1**.

Table 1

Year	UYWCD Mill Levy
1966-1973	0.200
1974	0.150
1975	0.130
1976	0.700
1977	0.500
1978	0.770
1979-1981	1.000
1982-1983	0.900
1984	1.376
1985	1.900
1986-1990	2.000
1991	2.500
1992	2.250
1993-1994	2.000
1995-present	1.820

UPPER YAMPA WATER
CONSERVANCY DISTRICT

Process of Valuation and Taxation of Property

The State establishes the parameters for valuation and taxation of Real, Personal, State Assessed and Natural Resources Property. The UYWCD levies taxes on certain Real, State Assessed and Natural Resources Property.

Real Properties valuations and corresponding collections are on a cycle that generally encompasses 5.5 years, with the first day of a 24-month property valuation period starting on July 1 of year 0, and the resulting accrued collections ending on December 31 of year 5.

- For Routt and Moffat counties, a 24-month valuation period of Real Property started on July 1, 2020 and ended on June 30, 2022. The resulting valuations are the basis for December 2023 and 2024 mill levy certifications and 2024 - 2025 fiscal year property tax collections. 2023 is a reassessment year and 2024 is an intervening year. **2020 to 2022 property values determine 2024-2025 fiscal years property tax collections.**
- For Routt and Moffat counties the next 24-month valuation period of Real Property started on July 1, 2022 and will end on June 30, 2024. The resulting valuations will be the basis for December 2025 and 2026 mill levy certifications and 2026 - 2027 fiscal year collections. 2025 is a reassessment year and 2026 is an intervening year. **2022 to 2024 property values determine 2026-2027 fiscal years property tax collections.**

State Assessed and **Natural Resources Property** are valued annually, and valuation is based on the prior year's income and the price of the production and the property.

The valuation, assessment, certification, and collection schedules pertaining the UYWCD – Real, State Assessed and Natural Resources Property - are illustrated in **Figure 2**.

UYWCD Revenue Sources by Property Classification, preliminary estimates for 2023

Every January 1, County assessors classify property according to its actual use.

Based on Property Classification and Property Value, assessors apply the appropriate Assessment Rates and calculate the Total Assessed Valuations for each local government within county boundaries.

Assessors provide Preliminary Assessed Valuations to taxing entities every August, and Final Assessed Valuations every December. Taxing entities use the preliminary and final Assessed Valuations to prepare their preliminary and final annual budgets, respectively.

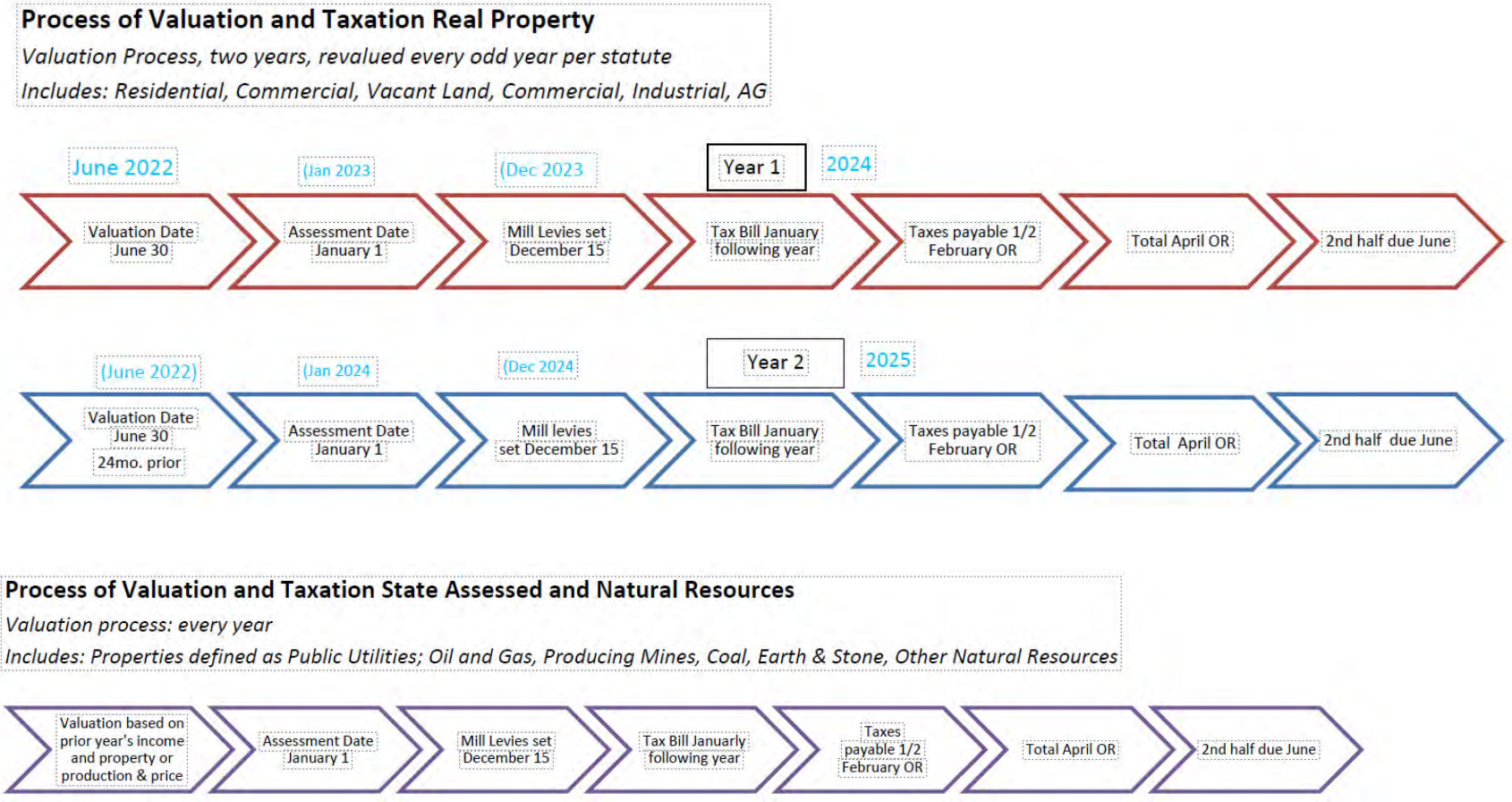
The preliminary August 2022 Assessed Valuations subject to UYWCD tax levies in Moffat and Routt counties for 2023 fiscal year collections, are shown in **Figures 3 & 4 and Tables 3 & 4**. The relative contribution by Property Classification is provided for each county.

The **State Assessed Property** classification represents **88.76%** of UYWCD Net Assessed Valuations in **Moffat County**.

Residential and Commercial Real Property combined represent **76.77%** of UYWCD Net Assessed Valuations in **Routt County**.

UPPER YAMPA WATER
CONSERVANCY DISTRICT

Figure 2



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CONSERVANCY DISTRICT

Figure 3

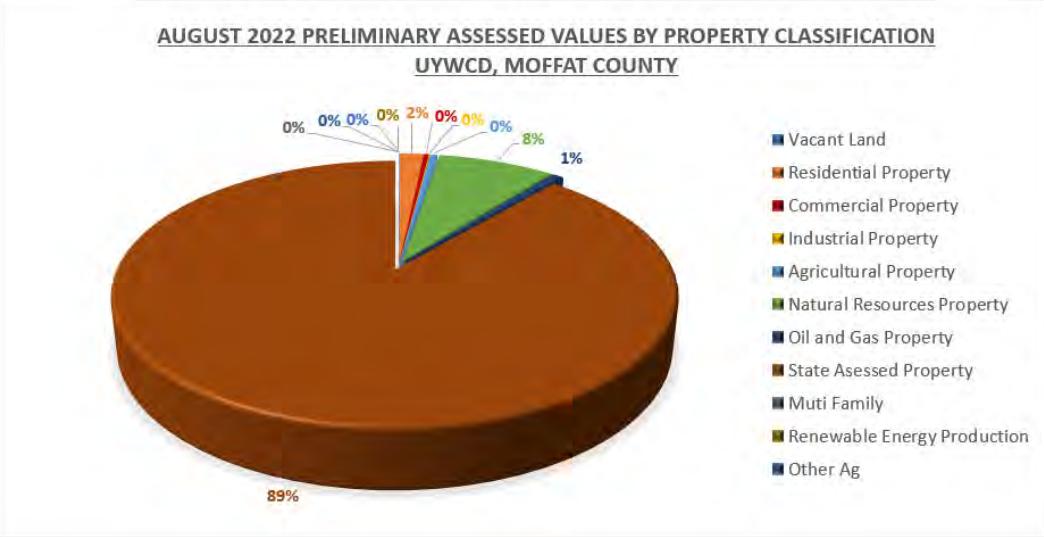


Table 3

UYWCD, Moffat County

Property Classification	August 2022 Assessed Valuation	Percentage of Value
Vacant Land	$82,710	0.05%
Residential Property	$2,696,750	1.62%
Commercial Property	$557,849	0.34%
Industrial Property	$125,671	0.08%
Agricultural Property	$761,653	0.46%
Natural Resources Property	$13,395,065	8.06%
Oil and Gas Property	$1,068,637	0.64%
State Asessed Property	$147,576,500	88.76%
Muti Family	$0	0.00%
Renewable Energy Production	$0	0.00%
Other Ag	$0	0.00%
TOTAL	**$166,264,835**	100.00%

Figure 4

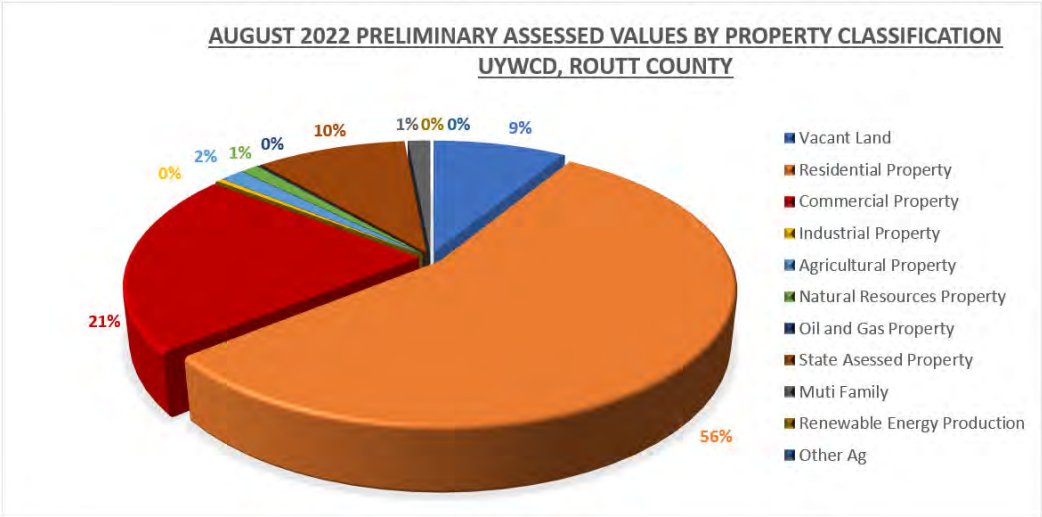


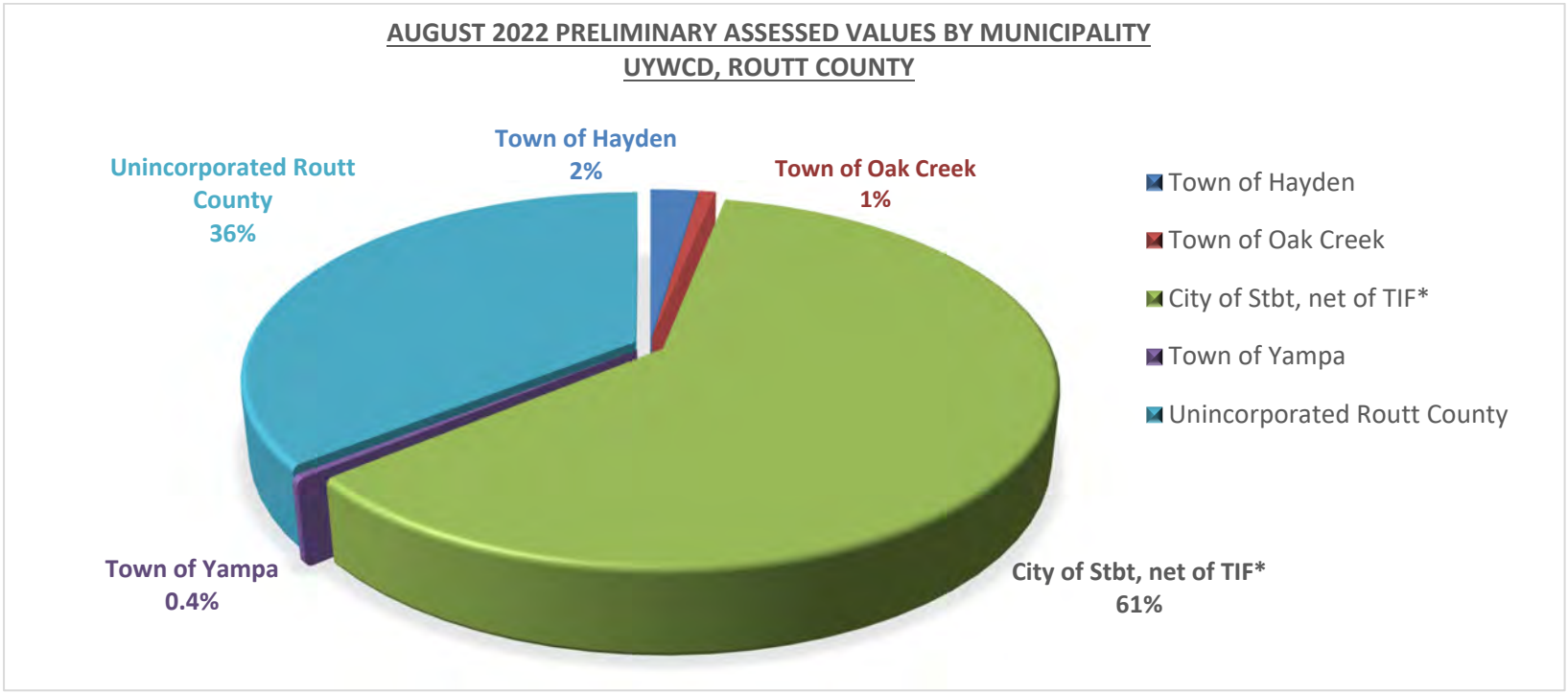
Table 4

UYWCD, Routt County

Property Classification	August 2022 Assessed Valuation	Percentage of Value
Vacant Land	$114,794,859	8.73%
Residential Property	$729,411,609	55.45%
Commercial Property	$280,406,567	21.32%
Industrial Property	$5,210,530	0.40%
Agricultural Property	$20,002,630	1.52%
Natural Resources Property	$14,977,970	1.14%
Oil and Gas Property	$1,566,910	0.12%
State Asessed Property	$129,693,150	9.86%
Muti Family	$19,097,274	1.45%
Renewable Energy Production	$11,540	0.00%
Other Ag	$175,320	0.01%
TOTAL	**$1,315,348,359**	100.00%

Assessed valuations associated with the UYWCD within **Routt County** are distributed among several municipalities (64% in aggregate) or are property located in Unincorporated Routt County (36%, **Figure 5**).

Figure 5

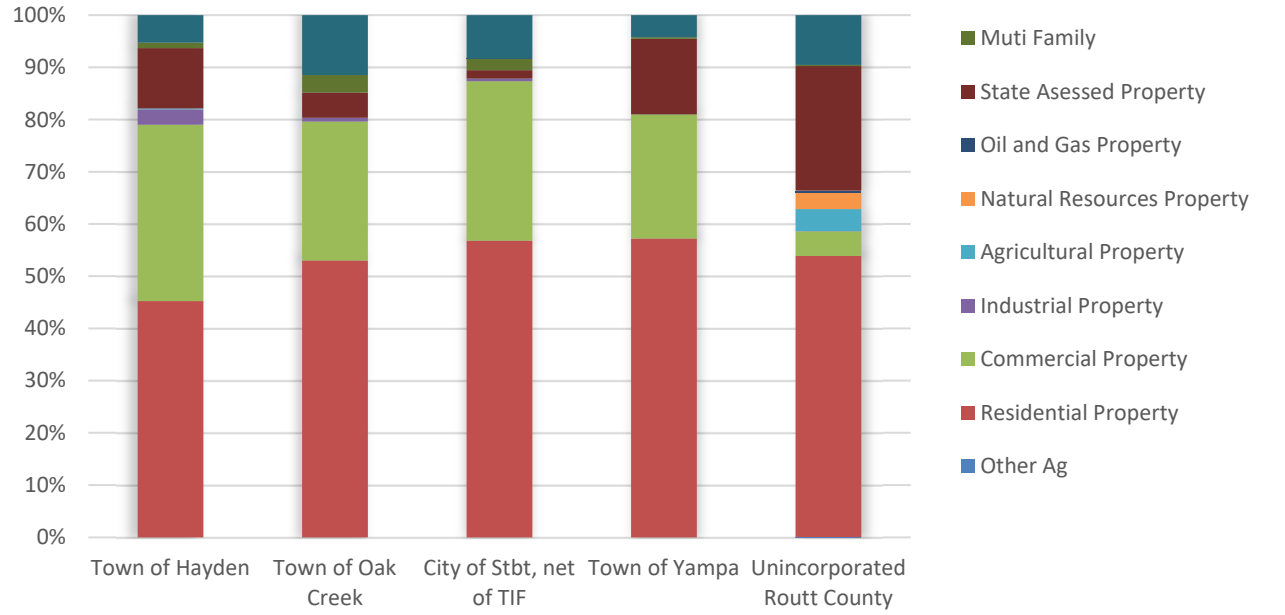


*Net of assessed values generating UYWCD property tax revenues diverted towards Steamboat's Urban Renewal Authority (URA) Tax Increment Financing (TIF)

Residential, Commercial, State Assessed and Vacant Land are the four property classifications with the larger aggregate share of assessed values associated with the UYWCD in **Routt County**, across all municipalities and in Unincorporated Routt County. (**Figure 6**).

FIGURE 6

AUGUST 2022 PRELIMINARY ASSESSED VALUES BY MUNICIPALITY AND PROPERTY CLASSIFICATION
UYWCD, ROUTT COUNTY



UPPER YAMPA WATER
CONSERVANCY DISTRICT

State Assessed and Natural Resources Property Valuations

State Assessed and **Natural Resources Property** classifications include power plants and coal mines. They are valued annually, and valuation is based on the prior year's income and the price of the production and the property.

As the energy industry in Routt and Moffat counties moves towards renewable energy production, the owners of power plants and their supplying coal mines in these counties have publicly announced changes in operations or the planned, gradual closure of facilities. The timing of closures has been broadly outlined but is yet to be specifically confirmed. The known facility closure information is as follows:

Moffat County:

- **Craig Station Unit 1 and 2**, owned by PacifiCorp, Platte River Power Authority, Salt River Project, and Tri-State Generation are to close in **2025 and 2028**.
- **Craig Station Unit 3**, solely owned by Tri-State, is to be shut down by **2030**.
- **Trapper Mine**, owned by Trapper Mining Inc, closure expected to follow/lag activities at the Craig Station(s); between **2026 and 2030**.

Routt County

- **Hayden Power Plant**, owned by Xcel Energy
  - Unit 2, to be closed by **2027**
  - Unit 1, to be closed by **2028**
- **Twenty Mile Coal Mine**, owned by Peabody Energy, reduced operations in recent years. Reduced production may continue through 2030.

Table 5 illustrates possible closure dates of coal mines and power plants within the UYWCD boundaries, and valuation and collection years that would be affected.

Table 5

Valuationyear ↓ ↓ ↓	Power & Coal Facilities, possible closing schedule (year)			Collection year ↓ ↓ ↓
	Craig Power Station	Trapper Mine	Hayden Powerplant	
2023				2024
2024				2025
2025	Unit 1, 2025			2026
2026		2026 to 2030		2027
2027			Unit 2, 2027	2028
2028	Unit 2, 2028		Unit 1, 2028	2029
2029				2030
2030	Unit 3, 2030			2031
2031				2032
2032				2033

UPPER YAMPA WATER
CONSERVANCY DISTRICT

For example, the retirement of Craig Station Unit 1 was announced to take place sometime in 2025. On January 1, 2026, the Moffat County assessor would reclassify the property according to its actual new use. Tax collections in the year 2026 would reflect adjustments in valuation, based on 2025 income, price of production and value of the property.

Based on the estimated retirement schedule that was published for the Craig Stations, the Trapper Mine and the Hayden Power Plant, there would be annual adjustments to collections for a six-year period, beginning in 2026 and ending in 2031.

An analysis of the most recent data available indicates that based on preliminary August 2022 valuations, UYWCD tax collections originating from energy production (power and coal) represent $428,651 or 16% of estimated 2023 UYWCD total levies.

Power and coal collections are 95% of estimated 2023 UYWCD revenues in Moffat County, and 6% of estimated District tax levies in Routt County (**Table 6).**

Table 6

Projected 2023 UYWCD Tax Revenues, based on August 2022 preliminary property valuations

Revenues by county and by source – energy/non-energy.

	Aug '22 assessed valuation	Mill Levy	Projected 2023 income	Comments
Routt	1,315,348,359	1.82	2,393,934	89% of all revenues originate in RC
Moffat	166,264,835	1.82	302,602	11% of all revenues originate in MC
	1,481,613,194		2,696,536	
Hayden Pwr Plant	63,451,380	1.82	115,482	
Twenty Mile Coal	13,641,340	1.82	24,827	
	77,092,720		140,309	140.3K RC Power & Coal revenues projected for '23
Craig Pwr Plant	145,208,892	1.82	264,280	
Trapper Mine	13,221,156	1.82	24,063	
	158,430,048		288,343	288.3K MC Power & Coal revenues projected for '23
2023 Projected income, excluding Energy sources listed above:				If we exclude powerplants & coal mines...
Routt	1,238,255,639	1.82	2,253,625	99.4% of all revenues originate in RC
Moffat	7,834,787	1.82	14,259	0.6% of all revenues originate in MC
	1,246,090,426		2,267,884	
PROJECTED INCOME, BY SOURCE:				
ROUTT	**1,315,348,359**	**1.82**	**2,393,934**	
Energy	77,092,720	1.82	140,309	6% of RC revenues originate in coal&power plant
Other	1,238,255,639	1.82	2,253,625	94% of RC revenues originate in all other sources
MOFFAT	**166,264,835**	**1.82**	**302,602**	
Energy	158,430,048	1.82	288,343	95% of MC revenues originate in coal&power plant
Other	7,834,787	1.82	14,259	5% of MC revenues originate in all other sources
ROUTT & MOFFAT	**1,481,613,194**	**1.82**	**2,696,536**	
Energy	235,522,768	1.82	428,651	16% of District revenues originate in coal&power plants
Other	1,246,090,426	1.82	2,267,885	84% of District revenues originate in all other sources

UPPER YAMPA WATER
CONSERVANCY DISTRICT

Real Property Valuations

Additional fluctuations in tax collections of future years are expected, following changes in **Real Property** valuations. These fluctuations follow a two-year cycle.

Valuations originating from the period July 1, 2020, to June 30, 2022, support the 2023 reassessment and the 2024 intervening year, for 2024 and 2025 collections (**Table 7).**

Table 7

Valuation Period (date range) // → → → → → → // start	end	Assessment year ↓ ↓ ↓		Collection year ↓ ↓ ↓
Jul 1, 2018	*Jun 30, 2020*	**2021**	**reassessment**	**2022**
		2022	intervening	2023
Jul 1, 2020	*Jun 30, 2022*	**2023**	**reassessment**	**2024**
		2024	intervening	2025
Jul 1, 2022	*Jun 30, 2024*	**2025**	**reassessment**	**2026**
		2026	intervening	2027
Jul 1, 2024	*Jun 30, 2026*	**2027**	**reassessment**	**2028**
		2028	intervening	2029
Jul 1, 2026	*Jun 30, 2028*	**2029**	**reassessment**	**2030**
		2030	intervening	2031
Jul 1, 2028	*Jun 30, 2030*	**2031**	**reassessment**	**2032**
		2032	intervening	2033
Jul 1, 2030	*Jun 30, 2032*	**2033**	**reassessment**	**2034**
		2034	intervening	2035

In August 2023 Routt and Moffat assessors will publish preliminary valuations that will allow the UYWCD to make an initial estimate of 2024 collections. 2025 collections are expected to be in a similar range.

While the Yampa Valley has experienced an increase in the market value of real property since the start of the pandemic in early 2020, the UYWCD experienced multiple decreasing valuation periods in the past (**Table 8)**.

Total UYWCD certified valuations decreased by 19.1% in the 2011 reassessment year, when compared with the prior valuation period. The following reassessment year, in 2013, valuations decreased again, by an additional 10%. Valuations had a slow recovery in reassessment years that followed, with a 5% and a 2.3% in 2015 and 2017, respectively (**Table 8)**.

UPPER YAMPA WATER
CONSERVANCY DISTRICT

Table 8

Dec-Dec Valuation, variation			Valuation Period (date range)		Assessment year		Collection year
Routt	Moffat	Total	start	end			
-21.5%	1.2%	-19.1%	Jul 1, 2008	Jun 30, 2010	**2011**	**reassessment**	**2012**
0.9%	0.2%	0.8%			2012	intervening	2013
-12.0%	3.2%	-10.0%	Jul 1, 2010	Jun 30, 2012	**2013**	**reassessment**	**2014**
-0.8%	-1.6%	-0.9%			2014	intervening	2015
5.9%	0.4%	5.0%	Jul 1, 2012	Jun 30, 2014	**2015**	**reassessment**	**2016**
0.8%	-1.0%	0.5%			2016	intervening	2017
4.4%	-10.2%	2.3%	Jul 1, 2014	Jun 30, 2016	**2017**	**reassessment**	**2018**
0.6%	12.5%	2.1%			2018	intervening	2019
10.6%	1.4%	9.3%	Jul 1, 2016	Jun 30, 2018	**2019**	**reassessment**	**2020**
0.1%	7.0%	1.0%			2020	intervening	2021
9.3%	-2.3%	7.7%	Jul 1, 2018	Jun 30, 2020	**2021**	**reassessment**	**2022**
					2022	intervening	2023

The UYWCD preliminary 2023 budget draft has been prepared for review and discussion. It currently indicates:

- 2023 UYWCD tax collections based on preliminary valuations are approximately 70% of annual UYWCD revenues.
- Tax levies are a significant funding source for UYWCD facilities.

Evaluation of the financial health of the UYWCD in future years should include following:

- The effect of annual inflation on a tax revenue cycle based on a two-year real property valuation period.
- The effect of annual inflation on a recurring five-and-a-half-year cycle, from beginning of real property valuations to end of collections.
- The multi-year period for revenues to return to earlier levels, after both increasing and decreasing two-year assessment cycles.
- Increasing capital maintenance and capital replacement costs, and appropriately matching capital reserves.
- Changing economic activities in Routt and Moffat counties.

UPPER YAMPA WATER
CONSERVANCY DISTRICT

BOARD COMMUNICATION FORM

From: Karina Craig, Chief Accountant.

Date: October 19, 2022

Item: **Preliminary 2023 Upper Yampa Water Conservancy District Budget**

_____ DIRECTION
_X_ INFORMATION
_____ MOTION
_____ RESOLUTION

I. Issue and Background Information:

As a local government levying property tax in the State of Colorado, the Upper Yampa Water Conservancy District (UYWCD) must comply with Colorado Revised Statutes (C.R.S.) that govern annual budget content, format, submittal to its governing body, publication, adoption and filing with the Colorado Department of Local Affairs (DOLA). Salient statutory deadlines in the annual budget calendar are:

- October 15, submittal of proposed budget to the governing body, C.R.S. 29-1-105.
- October 15, publication of "Notice of Budget", C.R.S. 29-1-106(1).
- December 15, budget adoption and certification of mill levy to county commissioners, C.R.S. 29-1-108(2) and (3), C.R.S. 39-5-128(1).
- January 31 of the new budget fiscal year, filing of the adopted budget with DOLA, C.R.S. 29-1-113(1).

UYWCD staff prepared a preliminary 2023 budget and presented it for Board of Directors' (BOD) review at the September 22, 2022, board meeting.

II. Summary and Additional Information:

<u>Tax Revenue Estimates</u>

As part of the budgeting process, the UYWCD develops tax revenue estimates as a multi-step process that extends beyond a single year. The process of Valuation and Taxation of Real Property follows a two-year cycle. Per statute, Real Property is revalued every odd year.

2023 will be a general reassessment year. Recent Real Property market value increases will be captured in June 2023 valuations and reflected in 2024 and 2025 budget revenues.

2022 is a non-reassessment year and 2022 valuations remain unchanged from 2021 on most properties. Therefore, 2023 revenues are expected to closely match 2022 collections.

UPPER YAMPA WATER
CONSERVANCY DISTRICT

Budget Format

- Continued recognition of Revenues and Expenditures by facility.
- Budget format updated to include Elk River Augmentation Plan (ERA).
- Property Tax Revenue dollars funding each facility shown in the Revenues section.

Reserve Funds and Revenues

- Preliminary Reserve Funds adjusted using the *most recent available 12-month period* Denver-Aurora-Lakewood All Items CPI Index; *Bimonthly* September 2021 to September 2022 index; 8.22%.
- Preliminary Power Sales revenues estimated with the 10-year Kilowatt-hour generation running average and the most recent available Combined Annual Average Energy Purchase Price (CAPP).
- Preliminary Water Storage and Ditch Share Fee Revenues adjusted based on the most recent available Index *established per contract terms*: Denver-Aurora-Lakewood All Items *Semiannual* CPI index. Semiannual Half 1 2021 to Half 1 2022 Index, 8.58%.
- Contracted water storage *volumes* adjusted, resulting from both terminated and newly executed 2022 contracts.
- Preliminary Interest Earned Revenues estimated based on most recent actual earnings.
- Preliminary 2023 Property Tax Revenues estimated per August 2022 preliminary assessed values: less than 1% variation from 2022 Budget Revenues.

Expenditures

- Preliminary Operating Expenses based on UYWCD staff input.
- UYWCD staff salaries adjusted using the *most recent available 12-month period* Denver-Aurora-Lakewood All Items CPI Index; *Bimonthly* September 2021 to September 2022 Index; 8.22%.
- Updated UYWCD staff health insurance benefit costs with 2023 provider rates.
- The one-time Town of Oak Creek/Sheriff Reservoir Grant was budgeted in 2022 and not in 2023, resulting in a preliminary net decrease in the Grants budget from 2022 to 2023.
- Increased expenditures for Yamcolo Capital Improvements for planned facility repairs.
- Increased expenditures for Stillwater Ditch Structural Repairs.

The preliminary budget document is presented with department budgets to provide a framework and supporting information for staff and BOD discussions and recommendations about overall 2023 District activities at the October 19, 2022, BOD Retreat. Revisions to the preliminary budget are expected, before it be considered for adoption at the November 16, 2022, regularly scheduled BOD meeting.

Budget items that may be modified include, but are not limited to:

- Adjustments to Power Sales Revenues due to updates to the CAPP.
- Adjustments after publication of September 2022 CPI indices, applicable to estimates of Stagecoach and Yamcolo Water Sales revenues, Stillwater Ditch Share fees and UYWCD Office Space Rent expenses.
- Adjustments to Water Sales volumes incorporating additional augmentation contracts executed in 2022.
- Adjustments to Tax Revenues and Treasurer Fee Expenses following Routt and Moffat Final Certifications of Values by December 15, 2022.
- Updates to Interest Revenues matching changing market conditions.
- Facilities operating and capital expenditure cost modifications pending UYWCD staff continued review of projects, resources, and budgeted activities.
- Proposed UYWCD staff annual compensation after staff performance reviews.
- Continued discussions and recommendations about UYWCD Grant Programs.
- Additional recommended tasks established through UYWCD Strategic Plan updates and stemming from BOD Annual Retreat discussions.

A Draft 2023 Budget is presented to the BOD in compliance with statutory requirements and DOLA best practice recommendations.

III. Staff Recommendation:

Continue 2023 Budget Discussions at the October 19, 2022, Board Retreat. Board and staff recommendations will be incorporated in the Final 2023 Budget to be submitted to the BOD for their consideration at the November 16, 2023, BOD meeting.

IV. Legal Issues:

Compliance with Budget statutory requirements per Colorado Revised Statutes (C.R.S. 29-1-105, C.R.S. 29-1-106 (1), C.R.S. 29-1-108 (2) and (3), C.R.S. 39-5-128(1) and C.R.S. 29-1-113(1).

V. Consistency with Board Goals and Policies:

UYWCD By-Laws and Strategic Plan Objective 3.

UPPER YAMPA WATER
CONSERVANCY DISTRICT

Attachments:

Attachment 1: Preliminary 2023 Upper Yampa Water Conservancy District Budget, including individual department budgets.

DRAFT

UPPER YAMPA WATER CONSERVANCY DISTRICT - 2023 BUDGET

September 22, 2022, accrual basis

	2021 ACTUALS Audited	2022 BUDGET Amended March 16, 2022	2023 BUDGET Draft Sept 22, 2022	*STAGECOACH*	*YAMCOLO*	*STILLWATER DITCH*	*ELK RIVER AUGMENTATION PLAN*	*GENERAL FUND*	*OPERATING*	*CAPITAL*
Fund Opening Balance including Encumbered Funds	17,536,141	18,778,813	19,000,618							
Encumbered Funds	5,875,302	6,133,474	6,602,783	5,881,639	545,495	76,478		99,171		
Emergency Facilities Reserve	4,606,931	4,814,243	5,209,973	4,855,026	320,950	33,997				
Capital Maintenance Reserve	772,752	807,526	873,905	606,879	224,545	42,481				
Stagecoach Wetlands Mitigation Reserve	419,734	419,734	419,734	419,734						
Tabor Reserve	75,885	91,971	99,171					99,171		
Capital Projects Development Fund	11,660,839	12,645,339	12,397,835					12,397,835		
Revenues										
Facilities										
Stagecoach Reservoir										
Power Sales	58,824	193,000	193,000	193,000					193,000	
Water Sales	228,487	189,190	216,568	216,568					216,568	
Yamcolo Reservoir										
Water Sales	139,374	169,025	188,053		188,053				188,053	
Stillwater Ditch & Reservoir Company	10,582	8,850	9,514			9,514			9,514	
Elk River Augmentation Water Sales	1,668	476	777				777		777	
Property taxes	2,719,734	2,715,657	2,696,536	1,109,389	395,361	355,485	3,878	832,422	1,496,869	1,199,667
Interest earned	15,204	11,300	425,927					425,927	425,927	
Other income										
Pass through income	63,728									
revenues	**3,237,601**	**3,287,499**	**3,730,375**	**1,518,957**	**583,414**	**364,999**	**4,655**	**1,258,350**	**2,530,708**	**1,199,667**
Expenditures										
Operating										
Facilities										
Stagecoach Reservoir	435,389	643,533	641,854	641,854					641,854	
Yamcolo Reservoir	131,307	154,277	165,432		165,432				165,432	
Stillwater Ditch & Reservoir Company	30,100	59,209	67,822			67,822			67,822	
Elk River Augmentation Plan	0	0	2,139				2,139		2,139	
Administration	294,343	344,750	365,104	138,630	40,161	10,953	584	174,775	365,104	
Board of Directors	52,669	117,913	111,900	42,489	12,309	3,357	179	53,567	111,900	
External Affairs	102,876	125,482	138,251	52,494	15,208	4,148	221	66,181	138,251	
Finance	105,482	147,310	153,670	58,349	16,904	4,610	246	73,562	153,670	
Legal	107,172	157,641	159,799	60,676	17,578	4,794	256	76,496	159,799	
Planning	83,816	283,571	286,772	108,887	31,545	8,603	459	137,278	286,772	
Grants, Scholarships & Public Information	202,455	408,039	357,069	135,579	39,278	10,712	571	170,929	357,069	
Treasurer fees	82,564	81,470	80,896					80,896	80,896	
Pass through expenses	56,629									
Subtotal Operating	**1,684,802**	**2,523,194**	**2,530,708**	**1,238,957**	**338,414**	**114,999**	**4,655**	**833,683**	**2,530,708**	
Capital										
Stagecoach Reservoir	198,921	297,500	280,000	280,000						280,000
Yamcolo Reservoir	56,411	130,000	245,000		245,000					245,000
Stillwater Ditch & Reservoir Company	54,795	115,000	250,000			250,000				250,000
Subtotal Capital	**310,127**	**542,500**	**775,000**	**280,000**	**245,000**	**250,000**				**775,000**
expenditures	**1,994,929**	**3,065,694**	**3,305,708**	**1,518,957**	**583,414**	**364,999**	**4,655**	**833,683**	**2,530,708**	**775,000**
net income (loss)	**1,242,672**	**221,805**	**424,667**					**424,667**		**424,667**
Ending Fund Balance	**18,778,813**	**19,000,618**	**19,425,285**							

1,492,118,940		
1.820	*1.010*	*0.810*
2,715,657	1,496,869	1,218,788
	55%	*45%*

Doug Monger, President

Andy Rossi, Secretary

REVENUES

ACCOUNT	SUBACCOUNT #	SUB-SUBACCOUNT	SUB-SUB-SUBACCOUNT	2021 BUDGET	2021 ACTUALS Audited	2022 BUDGET	2021 ACTUALS Aug 31,2022	2023 BUDGET SEPT 2022 DRAFT
STAGECOACH RESERVOIR				**382,190**	**313,853**	**382,190**	**245,852**	**409,568**
	POWER SALES			193,000	58,824	193,000	56,113	193,000
	WATER SALES			189,190	255,029	189,190	189,739	216,568
		AGRICULTURE AND IRRIGATION		877	2,946	877		984
		INDUSTRIAL		38,481	53,525	38,481	56,317	61,149
		MUNICIPAL		138,992	97,349	138,992	120,708	129,493
		ERC			84,286			5,204
		AUGMENTATION, YAMPA RIVER		10,759	10,548	10,759	8,400	15,055
		OTHER WATER SALES		82	2,175	82	4,314	4,684
		CONTRACT APPLICATION FEES			4,200			
YAMCOLO RESERVOIR				**169,025**	**112,832**	**169,025**	**93,486**	**188,053**
	WATER SALES			169,025	112,832	169,025	93,486	188,053
		AGRICULTURE AND IRRIGATION		79,650	51,148	79,650	42,291	87,800
			INDIVIDUAL IRRIGATORS	39,330	24,913	39,330		43,880
			YIA	40,320	26,235	40,320		43,920
		INDUSTRIAL						
		MUNICIPAL		89,375	61,685	89,375	51,195	100,253
		ENLARGEMENT						
STILLWATER DITCH & RESERVOIR COMPANY				**8,850**	**10,582**	**8,850**	**8,728**	**9,514**
	SHAREHOLDER CONTRACTS			8,850	8,518	8,850	8,728	9,514
	CARRIAGE CONTRACTS				2,064			
ELK RIVER AUGMENTATION PLAN, WATER SALES				**476**	**1,668**	**476**	**1,200**	**777**
PROPERTY TAXES				**2,720,454**	**2,719,734**	**2,715,657**	**2,798,527**	**2,696,536**
	ROUTT COUNTY			2,385,224	2,343,788	2,380,427	2,439,069	2,393,934
	MOFFAT COUNTY			335,230	375,945	335,230	359,457	302,602
INTEREST EARNED				**11,300**	**15,204**	**11,300**	**84,487**	**425,927**
OTHER INCOME							**1,500**	
PASSTHROUGH					**63,728**		**1,500**	
TOTAL				**3,292,296**	**3,237,600**	**3,287,499**	**3,235,280**	**3,730,375**

STAGECOACH OPERATING EXPENSES

ACCOUNT	SUBACCOUNT #	SUB-SUBACCOUNT	JOB	2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS Aug 31, 2022	2023 BUDGET Draft, Sep 22, 2022
0010	COMPENSATION			316,256	305,341	365,861	231,755	389,360
0020	DISTRICT INSURANCE			18,697	14,566	17,319	17,008	16,726
0030	TRAINING			3,000			4,814	
0040	TRAVEL, MEETINGS & CONFERENCES			1,000				2,000
	041 CONFERENCE EXPENSES							2,000
			Conf. registration					2,000
			Conf. meals, lodging & mileage					
0050	CONSULTING & CONTRACTED PROFESSIONAL SERVICES				5,443	38,500	3,865	5,000
	051 ENGINEERING SERVICES				5,255	38,500	3,865	5,000
		51- 01 Yampa River Augmentation Plan			1,663			
		51- 04 Other Engineering			3,593	38,500	3,865	5,000
			Safety Buoys			15,000		
			Union Ditch			20,000		
			Discretionary/Other			3,500		
	054 IT SERVICES				188			
0100	OTH OPERATING EXPENSES			146,462	110,040	221,853	83,848	228,768
	101 GENERAL MAINTENANCE			30,000	21,106	30,000	26,288	30,000
	102 PERMITS & WATER QUALITY			11,500	4,850	82,405	24,999	83,000
	103 STREAMGAGING			24,000	24,532	24,720	11,456	30,863
	104 VEHICLE & FUEL EXPENSES			6,000	7,327	6,000	7,606	9,943
	105 UTILITIES			14,962	16,891	18,728	9,826	14,962
		105- 01 Phone and Internet		3,462	4,462	5,728	3,009	3,462
		105- 02 Electrical Power		5,000	9,686	6,500	4,865	5,000
		105- 03 Snowplowing		6,500	2,743	6,500	1,953	6,500
	106 SMALL FURNITURE & SAFTY EQUIPMENT				163			
	109 OFFICE SUPPLIES				171			
	110 COMPUTERS & SOFTWARE						3,558	
	113 CONTRIBUTIONS & DUES			35,000	35,000	35,000		35,000
	117 CONTINGENCIES			25,000		25,000	115	25,000
TOTAL EXPENSES				**485,415**	**435,389**	**643,533**	**341,289**	**641,854**

STAGECOACH FIXED ASSETS

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5		2021 BUDGET	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS 31-Aug-2022	2023 BUDGET SEPT 2022 DRAFT
1	CAPITAL ASSETS *NOT* BEING DEPRECIATED					115,269	80,269	35,000		85,000
	1-10 STAGECOACH					115,269	80,269	35,000		85,000
		1-10-1 LAND & WATER RIGHTS				80,269	80,269			
		1-10-2 DAM STRUCTURE				35,000		35,000		50,000
		1-10-3 AMENITIES								35,000
					Wetlands					
					Discretionary					
2	CAPITAL ASSETS BEING DEPRECIATED					142,500	118,652	262,500	53,710	195,000
	2-10 STAGECOACH - DAM					132,500	117,272	137,500	5,705	195,000
		2-11 BLDNG & MECHANICAL				130,000	117,272	135,000	2,030	120,000
			2.11.1 POWER			100,000	80,831	130,000	2,030	120,000
				2.11.10 HYDROPLANT EQUIPMENT-GENERAL			71,048	60,000		
					Safety Buoys			60,000		
				2.11.11 TURBINE PARTS REPLACEMENT				50,000		50,000
				2.11.12 TRANSFER TRIP CIRCUIT REPLACEMENT						
				2.11.13 SPECIALTY EQUIPMENT						
				2.11.14 INVERTER REPLACEMENT						
				2.11.15 ELECTRONIC UPGRADES			9,783	10,000	2,030	10,000
				2.11.16 SCADA SYSTEM				10,000		
			2.11.2 NON-POWER			30,000	36,442	5,000		
				2.11.21 SHED						
				2.11.22 STEM GUIDE REPLACEMENT			36,442	5,000		
		2-12 NON MECHANICAL				2,500		2,500	3,675	75,000
			2.12.1 MONITORING EQUIPMENT						3,675	
			2.12.2 STRUCTURAL REPAIRS			2,500		2,500		75,000
	2-20 STAGECOACH - AMENITIES					10,000	1,380	125,000	48,005	
		2-21 FENCE								
		2-22 PARK BLDGS/IMPROVEMENTS						75,000		
		2-23 UNION DITCH HEADGATE					1,380	50,000	48,005	
	2-70 EQUIPMENT, VEHICLES, OTHER									
TOTAL FIXED ASSETS						**257,769**	**198,921**	**297,500**	**53,710**	**280,000**

YAMCOLO OPERATING EXPENSES

ACCOUNT		SUBACCOUNT #	SUB-SUBACCOUNT	2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS Aug 31, 2022	2023 BUDGET Draft, Sep 22, 2022
0010	COMPENSATION			102,277	95,948	112,481	71,708	120,858
0020	DISTRICT INSURANCE			3,545	2,306	3,046	2,904	3,074
0030	TRAINING			3,000				
0040	TRAVEL, MEETINGS & CONFERENCES			1,000	37			
0050	CONSULTING & CONTRACTED PROFESSIONAL SERVICES				2,416		90	
0100	OTH OPERATING EXPENSES			40,721	30,599	38,750	4,262	41,500
		101	GENERAL MAINTENANCE	10,000	5,888	10,000	2,541	10,000
		102	PERMITS & WATER QUALITY	21,000	22,459	21,000		21,000
		104	VEHICLE & FUEL EXPENSES	2,000	2,145	2,500	1,565	2,750
		105	UTILITIES	221	107	250	156	250
		117	CONTINGENCIES	7,500		5,000		7,500
	TOTAL EXPENSES			**150,543**	**131,307**	**154,277**	**78,964**	**165,432**

YAMCOLO FIXED ASSETS

LEVEL 1		LEVEL 2		LEVEL 3		LEVEL 4		LEVEL 5		2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS 31-Aug-2022	2023 BUDGET Draft, Sep 22, 2022
2	CAPITAL ASSETS BEING DEPRECIATED									**70,000**	**56,411**	**130,000**	**13,790**	**245,000**
		2-30	YAMCOLO							**70,000**	**56,411**	**130,000**	**13,790**	**245,000**
				2-31	BLDNG & MECHANICAL					15,000		70,000	13,790	240,000
						2.31.1	BUTTERFLY VALVE			15,000		50,000	13,790	30,000
						2.31.2	EQUIPMENT					20,000		20,000
				2-32	NON MECHANICAL					55,000	56,411	60,000		5,000
						2.32.1	MONITORING EQUIPMENT			15,000	12,246	10,000		5,000
						2.32.2	STRUCTURAL REPAIRS			40,000	44,165	45,000		
								2.32.21	SPILLWAY			5,000		
								2.32.22	RIP RAP	40,000	44,165	40,000		
						2.32.3	WETLANDS					5,000		
		2-70	EQUIPMENT, VEHICLES, OTHER											
	TOTAL FIXED ASSETS									**70,000**	**56,411**	**130,000**	**13,790**	**245,000**

STILLWATER DITCH OPERATING EXPENSES

ACCOUNT	SUBACCOUNT #	SUB-SUBACCOUNT	2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS Aug 31, 2022	2023 BUDGET Draft, Sep 22, 2022
0010 COMPENSATION			21,982	21,839	41,020	21,119	49,558
0020 DISTRICT INSURANCE			906	567	765	727	838
0030 TRAINING							
0100 OTH OPERATING EXPENSES			12,017	7,695	17,425	4,452	17,425
	101 GENERAL MAINTENANCE		9,780	1,359	10,000	586	10,000
	102 PERMITS & WATER QUALITY		220	200	200		200
	104 VEHICLE & FUEL EXPENSES			6,128	5,200	3,559	5,200
	105 UTILITIES		17	8	25	12	25
	113 CONTRIBUTIONS & DUES					295	
	117 CONTINGENCIES		2,000		2,000		2,000
TOTAL EXPENSES			34,905	30,100	59,209	26,297	67,822

STILLWATER DITCH FIXED ASSETS

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS 31-Aug-2022	2023 BUDGET Draft, Sep 22, 2022
2 CAPITAL ASSETS BEING DEPRECIATED				125,000	54,795	115,000	7,876	250,000
	2-40 STILLWATER DITCH			125,000	54,795	115,000	7,876	250,000
		2-42 NON MECHANICAL		125,000	54,795	115,000	7,876	250,000
			2.42.2 STRUCTURAL REPAIRS	125,000	54,795		7,876	250,000
	2-70 EQUIPMENT, VEHICLES, OTHER							
TOTAL FIXED ASSETS				125,000	54,795	115,000	7,876	250,000

ADMINISTRATION

OPERATING EXPENSES ACCOUNT	SUBACCOUNT #		2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS Aug 31, 2022	2023 BUDGET Draft, Sep 22, 2022
0010 COMPENSATION			169,024	161,489	177,667	114,656	189,385
0020 DISTRICT INSURANCE			4,701	2,891	4,048	3,850	4,435
0030 TRAINING			6,000	595	5,728	490	5,944
0040 TRAVEL, MEETINGS & CONFERENCES			455	822	2,560	1,055	2,034
0050 CONSULTING & CONTRACTED PROFESSIONAL SERVICES			15,736	11,640	19,500	5,494	19,500
	054	IT SERVICES	9,236	10,019	13,000	5,438	12,000
	055	OTHER CONSULTING	6,500	1,621	6,500	56	7,500
0100 OTH OPERATING EXPENSES			133,300	116,907	135,246	75,712	134,006
	104	VEHICLE & FUEL EXPENSES	500	410	500	381	500
	105	UTILITIES	8,820	9,321	10,000	6,070	
	106	SMALL FURNITURE & SAFTY EQUIPMENT	10,000		10,000		10,000
	107	OFFICE RENT	77,663	77,663	78,823	52,785	86,397
	108	CLEANING SERVICES	4,400	3,850	4,400	2,400	5,280
	109	OFFICE SUPPLIES	7,822	2,278	5,000	779	2,000
	110	COMPUTERS & SOFTWARE	13,650	19,201	15,373	8,496	17,529
	111	ADVERTISING	1,200	1,926	2,000		1,000
	113	CONTRIBUTIONS & DUES	2,645	2,257	3,150	4,460	5,300
	117	CONTINGENCIES	6,600		6,000	341	6,000
TOTAL EXPENSES			329,216	294,343	344,750	201,257	365,104

FIXED ASSETS ACCOUNT	SUBACCOUNT #		2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS 31-Aug-2022	2023 BUDGET SEPT 2022 DRAFT
0002 CAPITAL ASSETS BEING DEPRECIATED							
	0002-4	EQUIPMENT, VEHICLES AND OTHER	2,500				
TOTAL FIXED ASSETS			2,500				

BOARD OF DIRECTORS

ACCOUNT		SUBACCOUNT #		JOB	2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS Aug 31, 2022	2023 BUDGET Draft, Sep 22, 2022
0010	COMPENSATION				33,779	31,141	35,474	22,393	38,371
0020	DISTRICT INSURANCE				1,863	1,084	2,790	2,774	3,080
0040	TRAVEL, MEETINGS & CONFERENCES				68,590	20,402	69,549	17,520	59,900
		041	CONFERENCE EXPENSES		40,700	1,990	36,206	6,764	24,905
				Conf. registration			14,438	1,370	11,130
				Conf. meals, lodging & mileage			21,768	5,394	13,775
		042	DISTRICT MEETING EXPENSES		6,290	6,312	11,743	1,356	13,395
		043	DIRECTORS' COMPENSATION		21,600	12,100	21,600	9,400	21,600
0050	CONSULTING & CONTRACTED PROFESSIONAL SERVICES				10,000		10,000		10,000
0100	OTH OPERATING EXPENSES					42	100	213	550
		104	VEHICLE & FUEL EXPENSES			42	100	146	400
		111	ADVERTISING					67	150
	TOTAL				114,232	52,669	117,913	42,900	111,900

EXTERNAL AFFAIRS

ACCOUNT		SUBACCOUNT #		JOB	2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS Aug 31, 2022	2023 BUDGET Draft, Sep 22, 2022
0010	COMPENSATION				100,015	98,338	106,704	70,085	115,575
0020	DISTRICT INSURANCE				1,763	1,084	1,477	1,404	1,677
0030	TRAINING				3,000		3,000		4,500
0040	TRAVEL, MEETINGS & CONFERENCES				11,800	2,771	11,800	2,285	16,500
		041	CONFERENCE EXPENSES		11,800	2,771	11,800	2,285	16,500
				Conf. registration	5,000	1,580		1,594	7,500
				Conf. meals, lodging & mileage	6,800	1,192		691	9,000
0100	OTH OPERATING EXPENSES				700	682	2,500	546	
		104	VEHICLE & FUEL EXPENSES		700	682		546	
		117	CONTINGENCIES						
	TOTAL				117,278	102,876	125,482	74,320	138,251.44

FINANCE

ACCOUNT		SUBACCOUNT #		JOB	2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS Aug 31, 2022	2023 BUDGET Draft, Sep 22, 2022
0010	COMPENSATION				101,778	94,642	107,355	68,502	115,316
0020	DISTRICT INSURANCE				3,526	2,168	2,955	2,808	3,354
0030	TRAINING				5,000	100	5,000	145	5,000
0040	TRAVEL, MEETINGS & CONFERENCES				1,000		1,000	119	1,000
		041	CONFERENCE EXPENSES					119	
				Conf. registration				119	
				Conf. meals, lodging & mileage					
0050	CONSULTING & CONTRACTED PROFESSIONAL SERVICES				40,000	8,500	29,000	9,000	29,000
		055	OTHER CONSULTING		40,000	8,500	29,000	9,000	29,000
				Audit	10,000	8,500	9,000	9,000	9,000
				General / other	30,000		20,000		20,000
0100	OTH OPERATING EXPENSES				3,000	72	2,000	468	
	TOTAL				154,304	105,482	147,310	81,041	153,670

LEGALS

ACCOUNT		SUBACCOUNT #		SUB-SUBACCOUNT	2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS Aug 31, 2022	2023 BUDGET Draft, Sep 22, 2022
0010	COMPENSATION				21,742	20,592	22,903	14,824	24,960
0020	DISTRICT INSURANCE				881	542	739	702	838
0050	CONSULTING & CONTRACTED PROFESSIONAL SERVICES				120,000	86,038	120,000	62,796	120,000
		052	GENERAL MATTERS & MASTER PLAN			27,888		37,470	
				General Matters		27,888		37,470	
		053	OTHER LEGAL SERVICES			58,150		25,326	
				Pricing inclusive		39,979		15,310	
				Pricing exclusive		18,172		10,016	
		055	OTHER CONSULTING						
0100	OTH OPERATING EXPENSES				14,000		14,000		14,000
		117	CONTINGENCIES		14,000		14,000		14,000
	TOTAL				156,623	107,172	157,641	78,322	159,799

PLANNING

ACCOUNT		SUBACCOUNT #		SUB-SUBACCOUNT		2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS Aug 31, 2022	2023 BUDGET Draft, Sep 22, 2022
0010	COMPENSATION					22,652	21,425	23,807	15,427	25,933
0020	DISTRICT INSURANCE					881	542	739	702	838
0050	CONSULTING & CONTRACTED PROFESSIONAL SERVICES					62,500	55,831	250,000	65,233	250,000
		051	ENGINEERING SERVICES			62,500	55,831		65,233	
				51- 01	Yampa River Augmentation Plan	2,500	3,156		2,268	
				51- 02	Elk River Augmentation Plan	2,500	1,065			
				51- 03	CDSS modeling update	12,500				
				51- 04	Other Engineering	45,000	51,610		62,966	
0100	OTH OPERATING EXPENSES					9,019	6,018	9,025	135	10,000
		102	PERMITS & WATER QUALITY			19		25		
		103	STREAMGAGING			6,500	5,831	6,500		7,500
		104	VEHICLE & FUEL EXPENSES				187		35	
		110	COMPUTERS & SOFTWARE						100	
		117	CONTINGENCIES			2,500		2,500		2,500
	TOTAL					95,053	83,816	283,571	81,497	286,772

PUBLIC INFORMATION

ACCOUNT		SUBACCOUNT #		JOB	2021 BUDGET Amended, Nov 17, 2021	2021 ACTUALS Audited	2022 BUDGET Amended, March 13, 2022	2022 ACTUALS Aug 31, 2022	2023 BUDGET Draft, Sep 22, 2022
0010	COMPENSATION				73,559	73,871	79,269	52,483	85,734
0020	DISTRICT INSURANCE				588	361	493	468	559
0030	TRAINING				3,000				
0040	TRAVEL, MEETINGS & CONFERENCES							2,850	
0050	CONSULTING & CONTRACTED PROFESSIONAL SERVICES								
0100	OTH OPERATING EXPENSES				211,200	128,223	328,277	98,674	270,777
		109	OFFICE SUPPLIES			208			
		111	ADVERTISING		5,000	1,140	5,000		5,000
		112	WEBSITE & COMMUNICATIONS		25,000	9,475	30,000	12,259	35,000
		113	CONTRIBUTIONS & DUES		52,200	41,289	57,200	34,915	74,700
				CWC	7,200			5,434	7,200
				WECO	7,500			2,250	7,500
				CAA	1,000			1,000	1,000
				RCDEH	12,000			12,370	12,000
				Annual event & oth	20,000			6,111	30,000
				Annual report	2,500				5,000
				WQ outreach SC	2,000				2,000
				Sponsorships				7,750	
				Discretionary					
		114	SCHOLARSHIPS		4,000	4,000	10,000		10,000
		115	GRANTS		125,000	72,111	226,077	51,500	146,077
				DIIP	75,000		71,077		71,077
				Other grants	50,000		75,000		75,000
				Sheriff Reservoir			80,000		
TOTAL					288,346	202,455	408,039	154,474	357,069

NEW BUSINESS

EXECUTIVE SESSIONS

Executive session under CRS § 24-6-402(4)(b) to discuss legal issues on Water Resumes, Water Cases, Contract Negotiations and _____. Mere presence or participation of an attorney at an executive session is not sufficient to satisfy the requirements of CRS § 24-6-402(4)(b). Executive sessions to discuss legal matters are not recorded.

Executive session under CRS § 24-6-402(4)(e)(I) for the purpose of determining positions relative to matters that may be subject to negotiations; developing strategy for negotiations; and instructing negotiators with respect to _____. This session will be recorded, and a copy of the recording maintained for not less than 90 days.

BOARD ACTIONS IN REGARD TO EXECUTIVE SESSION

DETERMINATION OF NEXT MEETING(s) AGENDA(s)

AGENDA

UPPER YAMPA WATER CONSERVANCY DISTRICT
BOARD OF DIRECTORS MEETING
WEDNESDAY, NOVEMBER 16, 2022 (12:00 PM)
MOUNTAIN VALLEY BANK COMMUNITY ROOM
2220 CURVE PLAZA, STEAMBOAT SPRINGS, CO
ONLINE MEETING:

HTTPS://US06WEB.ZOOM.US/J/87995099756?PWD=MEXYK055VLI0RNVTWLRIEDZ5R1VIUT09

THE UPPER YAMPA WATER CONSERVANCY DISTRICT REQUESTS THAT UNVACCINATED PEOPLE ATTENDING THE BOARD OF DIRECTORS MEETING AT THE MOUNTAIN VALLEY BANK COMMUNITY ROOM WEAR A MASK.

MATERIALS FOR BOARD PACKET DUE: NOVEMBER 7, 2022, BY 5:00 PM

INSTRUCTIONS ON HOW TO JOIN A ZOOM MEETING FOLLOW THE AGENDA

A Board of Directors meeting packet is available for public review on our website at https://upperyampawater.com/agendas-and-meeting-documents/ by the Friday before the meeting. Amendments to the Agenda and new documents that are generated or submitted after the original posting of the meeting materials will be posted under "Additional Documents" on the website for the relevant meeting.

QUESTIONS ON AGENDA AND/OR BOARD MATERIALS: Members of the public or Board of Directors with questions on the agenda or meeting materials, including the consent agenda, are welcome to contact the General Manager at the District offices prior to the meeting. You may reach the General Manager at: arossi@upperyampawater.com or (970) 871-1035 Ext. 2.

MEETING PROCEDURE: Comments from the Public are welcome at two different times during the course of the meeting: 1) Comments no longer than three (3) minutes on items **not** scheduled on the Agenda will be heard under Public Input and Comment; and 2) Comments no longer than three (3) minutes on all scheduled public hearing items will be heard following the presentation. Please wait until you are recognized by the President. With the exception of subjects brought up during Public Input and Comment, on which no action will be taken or a decision made, the Board may take action on, and may make a decision regarding, ANY item referred to in this agenda, including, without limitation, any item referenced for "review", "update", "report", or "discussion" whether or not listed as an "Action Item."

(1) **12:00 PM** Establishment of Quorum and Call to Order
(2) **12:00 PM** Approval of Agenda for Meeting **Action item**
(3) **12:05 PM** Public Input and Comment
The Board will make no decision nor take action, except to direct the General Manager. Those addressing the Board are requested to identify themselves by name, organization, if any, and address. Comments shall not exceed three (3) minutes.
a. Update from Erin Light
(4) **12:10 PM** Consent Agenda **Action item**
a. Approval of the Minutes of the September 22, 2022, Board Meeting and

October 19, 2022, Board Retreat

b. Financials
   i. Approval of Disbursements
   ii. Budget Comparison

(5) **12:15 PM** Report of General Manager
   a. UYWCD 2022 Budget Amendment? **Action Item**
   b. UYWCD 2023 Proposed District Meeting Schedule **Action item**
   c. Update on Winter Holiday Party 02/16/23
   d. Update on Reservoir Firming Projects
   e. UYWCD 2023 Budget (Including Resolutions) **Action item**
   f. Augmentation Plans Contract Updates
   g. Notice of Expiring Director Terms
   h. Resolution to Opt-Out of Colorado Family Medical and Leave Insurance program **Action item**

   Time will be allocated for public comment if any.

(6) **2:30 PM** District Engineer Report
   a. Update on Reservoir Water Status
   b. Stillwater Reservoir Infrastructure Ownership Agreement

(7) **2:45 PM** Public Information Updates
   a.

(8) **3:00 PM** Board Member Reports
   a.

(9) **3:15 PM** Report of General Counsel
   a.

(10) **3:30 PM** Pending Water Cases
   a. Water Resumes
   b. Status of Other Water Cases Including UYWCD Diligence Filings

(11) **3:45 PM** New Business (Limited to emergency matters that came up During the course of the meeting) **Action item**

(12) **4:00 PM** Executive Sessions:
   a. Executive session under CRS § 24-6-402(4)(b) to discuss legal issues on Water Resumes, Water Cases, Contract Negotiations and_____(insert description) . Mere presence or participation of an attorney at an executive session is not sufficient to satisfy the requirements of CRS § 24-6-402(4)(b). Executive sessions to discuss legal matters are not recorded.
   b. Executive session under CRS § 24-6-402(4)(e)(I) for the purpose of determining positions relative to matters that may be subject to negotiations; developing strategy for negotiations; and instructing negotiators with respect to _____(insert brief description). This session will be recorded, and a copy of the recording maintained for not less than 90 days.

(13) **4:15 PM** Board Actions in Regard to Executive Session

(14) **4:25 PM** Determination of Next Meeting(s) Agenda(s)

(15) **4:30 PM** Adjournment.