COLORADO
Colorado Water Conservation Board
Department of Natural Resources

1313 Sherman Street, Room 718
Denver, CO 80203

P (303) 866-3441
F (303) 866-4474

Jared Polis, Governor

Dan Gibbs, DNR Executive Director

Lauren Ris, CWCB Director

TO: Colorado Water Conservation Board Members

FROM: Robert Viehl, Chief
Brandy Logan, Water Resource Specialist
Marielle Sidell, Hydrologist
Stream and Lake Protection Section

DATE: January 27, 2026

AGENDA ITEM: 21a. Request to Form Intent to Appropriate Instream Flow Water Rights in Water Divisions 1, 2, 6, and 7.

Staff Recommendation

Staff recommends that, pursuant to ISF Rule 5d., the Board declare its intent to appropriate an instream flow (ISF) water right on each stream segment listed in Table 1, and direct staff to publicly notice the Board's declaration of its intent to appropriate.

Introduction

This memo provides an overview of the technical analyses performed by the recommending entities and CWCB staff on ISF recommendations in Water Divisions 1, 2, 6, and 7. This work was conducted to provide the Board with sufficient information to declare its intent to appropriate ISF water rights in accordance with the Rules Concerning the Colorado Instream Flow and Natural Lake Level Program (ISF Rules). The executive summaries and links to the appendices containing supporting scientific data are provided in the attached Table of Contents.

In addition, the scientific data and technical analyses performed by the recommending entity are accessible on the Board's website at:
https://cwcb.colorado.gov/2026-isf-recommendations

Natural Environment Studies

Colorado Parks and Wildlife (CPW) documented the natural environment on their recommendation and found natural environments that can be preserved. To evaluate instream flow requirements, CPW collected hydraulic data and performed R2Cross modeling on all segments. Staff reviewed each proposed ISF segment to ensure that the dataset is complete, and proper methods and procedures were followed. Staff also conducted site visits to each recommendation. CWCB staff worked with CPW to develop final recommendations for the flow rates of water necessary to preserve the natural environment to a reasonable degree.

Water Availability Studies
To determine the amount of water physically available for the recommended streams, staff analyzed available streamflow gage records, available streamflow models, and/or utilized appropriate standard methods to develop a hydrograph showing median daily or mean monthly flows for each stream flow recommendation. In addition, staff analyzed the water rights tabulation for each stream to identify any potential water availability problems. In some cases, the flow rates were modified due to water availability limitations. The recommending entities confirmed that the proposed flow rates would preserve the natural environment to a reasonable degree on each stream segment. Based on these analyses, staff determined that water is available for appropriation on each stream segment listed in Table 1 to preserve the natural environment to a reasonable degree.

Stakeholder Outreach
Staff provided public notice of the recommendations to the ISF subscription mailing list, posted public notices in local newspapers, gave presentations to County Commissioners, and contacted landowners adjacent to the proposed ISF reaches. In addition, staff contacted water commissioners, water right holders, and others, when possible, to further discuss the recommendations. Detailed information on stakeholder outreach is contained in the attached executive summary for each recommendation.

Instream Flow Rule 5d
Rule 5d. provides that the Board may declare its intent to appropriate ISF water rights after reviewing staff's recommendations for the proposed appropriations. Rule 5d. also sets forth actions that staff must take after the Board declares its intent that initiate the public notice and comment procedure for the ISF appropriations. Specifically:

5d. Board's Intent to Appropriate. Notice of the Board's potential action to declare its intent to appropriate shall be given in the January Board meeting agenda and the Board will take public comment regarding its intent to appropriate at the January meeting.

(1) After reviewing Staff's ISF recommendations for proposed ISF appropriations, the Board may declare its intent to appropriate specific ISF water rights. At that time, the Board shall direct the Staff to publicly notice the Board's declaration of its intent to appropriate.

(2) After the Board declares its intent to appropriate, notice shall be published in a mailing to the ISF Subscription Mailing Lists for the relevant water divisions and shall include:

(a) A description of the appropriation (e.g. stream reach, flow amounts, etc.);

(b) Availability (time and place) for review of Summary Reports and Investigations Files for each recommendation; and,

(c) Summary identification of any data, exhibits, testimony or other information

in addition to the Summary Reports and Investigations Files supporting the appropriation.

(3) Published notice shall also contain the following information:

(a) The Board may change flow amounts of contested ISF appropriations based on information received during the public notice and comment period.

(b) Staff will maintain, pursuant to Rule 5e.(3), an ISF Subscription Mailing List for each water division composed of the names of all persons who have sent notice to the Board Office that they wish to be included on such list for a particular water division. Any person desiring to be on the ISF Subscription Mailing List(s) must send notice to the Board Office.

(c) Any meetings held between Staff and members of the public will be open to the public. Staff may provide Proper Notice prior to any such meetings and may provide notice to persons on the ISF Subscription Mailing List(s).

(d) Any Notice to Contest must be received at the Board office no later than March 31st, or the first business day thereafter. All Notices of Party status and Contested Hearing Participant status must be received at the Board office no later than April 30th, or the first business day thereafter.

(e) Staff will announce its Final Staff ISF Recommendation concerning contested appropriations at the September Board meeting and will send notice of the Final Staff Recommendation to all persons on the Contested Hearing Mailing List.

(f) The Board may take final action on any uncontested ISF appropriations at the May Board meeting.

(4) After the Board declares its intent to appropriate, notice of the Board's action shall be mailed within five working days to the County Commissioners of the county(ies) in which the proposed reach is located.

(5) Final action by the Board on ISF appropriations will occur no earlier than the May Board Meeting.

Attachments

Public Comment Letters
Table of Contents for ISF Recommendation Executive Summaries
ISF Executive Summaries

Table 1. Instream Flow Recommendations

Div	Stream	Watershed	County	Length (miles)	Upper Terminus	Lower Terminus	Flow (cfs)
1	East Fork Roaring Creek	Cache La Poudre	Larimer	3.49	headwaters	confluence Roaring Creek	0.6 (10/01 - 03/31) 1.9 (04/01 - 04/30) 2.9 (05/01 - 07/31) 1.5 (08/01 - 09/30)
2	Cottonwood Creek	Arkansas Headwaters	Custer	4.14	headwaters	USFS Boundary	0.4 (12/01 - 04/15) 1.0 (04/16 - 05/16) 6.3 (05/17 - 07/10) 1.7 (07/11 - 08/31) 0.75 (09/01 - 11/30)
6	Bear Creek	Upper White	Garfield	3.09	headwaters	confluence North Fork White River	0.65 (10/01 - 04/30) 2.9 (05/01 - 07/31) 2.4 (08/01 - 09/30)
6	Big Fish Creek	Upper White	Garfield	4.30	headwaters	confluence North Fork White River	2.3 (10/01 - 03/31) 8.5 (04/01 - 09/30)
6	Hauskins Creek	Upper White	Garfield	2.11	headwaters	confluence North Fork White River	0.65 (08/01 - 05/20) 2.9 (05/21 - 06/30) 0.5 (07/01 - 07/31)
6	Lynx Creek	Upper White	Garfield	1.58	headwaters	confluence North Fork White River	0.8 (01/01 - 05/14) 1.5 (05/15 - 08/14) 1.2 (08/15 - 09/30) 0.9 (10/01 - 12/31)
6	Picket Pin Creek	Upper White	Garfield	2.66	headwaters	confluence North Fork White River	0.6 (10/01 - 05/15) 2.2 (05/16 - 07/20) 1.2 (07/21 - 09/30)
7	Pando Creek	Animas	San Juan	1.87	headwaters	confluence Cascade Creek	0.4 (09/01 - 03/31) 1.3 (04/01 - 04/30)

Div	Stream	Watershed	County	Length (miles)	Upper Terminus	Lower Terminus	Flow (cfs)
							3.8 (05/01 - 06/30) 1.1 (07/01 - 08/31)

SAN JUAN COUNTY
COLORADO

1557 GREENE STREET
P.O. BOX 466
SILVERTON, COLORADO 81433
PHONE 970-387-5766 admin@sanjuancolorado.us

December 17, 2025

Colorado Water Conservation Board
Department of Natural Resources

To Whom It May Concern:

During their regular meeting of December 15, 2025, the San Juan County Commissioners reviewed the recommendation for the 2026 Instream Flow streams located within San Juan County. The Commissioners believe it is in the best interest of San Juan County to support the requested Instream Flow rates for Pando Creek and Mill Creek as presented.

Thank you for your consideration.

Sincerely,

William A. Tookey
San Juan County Administrator

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January 2026 Instream Flow Recommendations

Clicking on the Executive Summary links below will jump to the correct bookmark in this pdf document. Clicking on the Appendices links below will open a web page linked to the supporting data.

East Fork Roaring Creek Executive Summary

CWCB STAFF INSTREAM FLOW RECOMMENDATION
January 26-27, 2026

UPPER TERMINUS:	headwaters in the vicinity of UTM North: 4511657.49 UTM East: 440448.44
LOWER TERMINUS:	confluence with Roaring Creek at UTM North: 4507614.75 UTM East: 437719.29
WATER DIVISION/DISTRICT:	1/3
COUNTY:	Larimer
WATERSHED:	Cache La Poudre
CWCB ID:	24/1/A-002
RECOMMENDER:	Colorado Parks and Wildlife (CPW)
LENGTH:	3.49 miles
FLOW RECOMMENDATION:	0.6 cfs (10/01 - 03/31) 1.9 cfs (04/01 - 04/30) 2.9 cfs (05/01 - 07/31) 1.5 cfs (08/01 - 09/30)

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BACKGROUND

Colorado's General Assembly created the Instream Flow and Natural Lake Level Program in 1973, recognizing "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3), C.R.S.). The statute vests the Colorado Water Conservation Board (CWCB or Board) with the exclusive authority to appropriate and acquire instream flow (ISF) and natural lake level (NLL) water rights. Before initiating a water right filing, the Board must determine that: 1) there is a natural environment that can be preserved to a reasonable degree with the Board's water right if granted, 2) the natural environment will be preserved to a reasonable degree by the water available for the appropriation to be made, and 3) such environment can exist without material injury to water rights.

The information contained in this Executive Summary and the associated supporting data and analyses form the basis for staff's ISF recommendation to be considered by the Board. This Executive Summary provides sufficient information to support the CWCB findings required by ISF Rule 5i on natural environment, water availability, and material injury. Additional supporting information is located at: https://cwcb.colorado.gov/2026-isf-recommendations.

RECOMMENDED ISF REACH

CPW recommended that the CWCB appropriate an ISF water right on a reach of East Fork Roaring Creek at the ISF Workshop in January, 2023. East Fork Roaring Creek is located within Larimer County and is approximately 30 miles northwest from the City of Fort Collins (See Vicinity Map). The stream originates near South Bald Mountain in the Medicine Bow Mountains in the Roosevelt National Forest and flows southwest until it reaches the confluence with Roaring Creek. East Fork Roaring Creek is a tributary to Roaring Creek which is a tributary to the Cache la Poudre River before it flows into the South Platte River.

The proposed ISF reach extends from the headwaters downstream to the confluence with Roaring Creek for a total of 3.49 miles. The proposed reach is entirely on public land, on the Roosevelt National Forest (See Land Ownership Map). CPW is recommending ISF protection on this stream to preserve the natural environment and to fulfill CPW's statutory charge that fish and wildlife resources and their environment should be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors. Securing an ISF water right on this reach will assist in protecting the fishery and conserving fish habitat in alignment with CPW's statutory directive and strategic planning documents. Specifically, this stream supports greenback cutthroat trout a subspecies of cutthroat trout native to the South Platte River Basin. Greenback cutthroat trout are classified as federally threatened, state threatened, and are considered a Species of Greatest Conservation Need, per CPW's State Wildlife Action Plan (CPW, 2015; SWAP). CPW is committed to taking actions to preserve and protect conservation populations of these species and watershed and stream conditions they rely on.

OUTREACH

Stakeholder input is a valued part of the CWCB staff's analysis of ISF recommendations. Currently, more than 1,100 people subscribe to the ISF mailing list. Notice of the potential appropriation of an ISF water right on East Fork Roaring Creek was sent to the mailing list in November 2025, March 2025, March 2024, and March 2023. As this reach is entirely on public land, the Unites States Forest Service was notified of this recommendation on August 25, 2025. A public notice about this recommendation was also published in the Fort Collins Coloradoan on December 11, 2025.

Staff presented information about the ISF program and this recommendation to the Larimer County Board of County Commissioners on two occasions, on December 11, 2023 and more recently on October 20, 2025. In addition, staff spoke with Mark Simpson, District 3 Deputy Water Commissioner, on April 11, 2023 regarding water

availability on East Fork Roaring Creek. Mr. Simpson confirmed CWCB staff's understanding of water administration in the East Fork Roaring Creek.

NATURAL ENVIRONMENT

CWCB staff relies on the recommending entity to provide information about the natural environment. In addition, staff reviews information and conducts site visits for each recommended ISF appropriation. This information provides the Board with a basis for determining that a natural environment exists.

East Fork Roaring Creek is a first order tributary of the Cache la Poudre River and is forested and mountainous. Hydrology of the creek is driven by snowmelt runoff with perennial baseflows. East Fork Roaring Creek is a steep, cascading stream with very coarse substrate (mostly large boulders and some bedrock outcrops). There are many moderately sized pools that provide good habitat for small fish. There are small pockets of gravel that provide the resident fish population with spawning habitat.

In 2020, the Cameron Peak wildfire burned much of the surrounding area. Portions of the Roaring Creek watershed were impacted and precipitation events on the large burn scar area have resulted in debris and sediment flows which reconfigured the channel. Fortunately, much of the stream corridor was not burned and has an intact riparian zone with a high diversity of shrubs and coniferous forest. The watershed appears to be actively recovering with signs of regeneration.

As part of the greenback cutthroat trout recovery strategy, CPW has stocked greenback cutthroat trout in East Fork Roaring Creek for the past three years (Table 1). Despite impacts from the Cameron Peak fire, CPW has observed survival of stocked fish, which provides evidence of overwintering and favorable habitat conditions to support a self-sustaining population of greenback cutthroat trout.

CWCB staff observed mayfly, caddisfly, and vegetation including moss during R2Cross data collection.

Table 1. List of species identified in East Fork Roaring Creek.

Species Name	Scientific Name	Status
greenback cutthroat trout	*Oncorhynchus clarkii stomias*	Federal - Threatened Species State - Species of Greatest Conservation Need State - Threatened Species

ISF QUANTIFICATION

CWCB staff relies on the biological expertise of the recommending entity to quantify the amount of water required to preserve the natural environment to a reasonable degree. CWCB staff performs a thorough review of the quantification analyses completed by the recommending entity to ensure consistency with accepted standards.

Quantification Methodology

CPW staff used the R2Cross method to develop the initial ISF recommendation. The R2Cross method is based on a hydraulic model and uses field data collected in a stream riffle (CWCB, 2022; CWCB, 2024). Riffles are the stream habitat type that are most vulnerable to dry if streamflow ceases. The data collected consists of a streamflow measurement, a survey of channel geometry and features at a cross-section, and a survey of the longitudinal slope of the water surface.

The R2Cross model uses Ferguson's Variable-Power Equation (VPE) to estimate roughness and hydraulic conditions at different water stages at the measured cross-section (Ferguson, 2007; Ferguson, 2021). This approach is based on calibrating the model as described in Ferguson (2021). The model is used to evaluate three hydraulic criteria: average depth, average velocity, and percent wetted perimeter. Maintaining these hydraulic parameters at adequate levels across riffle habitat types also will maintain aquatic habitat in pools and runs for most life stages of fish and aquatic

macroinvertebrates (Nehring, 1979). CPW staff use the model results to develop an initial recommendation for summer and winter flows. The summer flow recommendation is based on the flow that meets all three hydraulic criteria. The winter flow recommendation is based on the flow that meets two of the three hydraulic criteria.

The R2Cross method estimates the biological amount of water needed for summer and winter periods. The recommending entity uses the R2Cross results and its biological expertise to develop an initial ISF recommendation. CWCB staff then evaluates water availability for the reach typically based on median hydrology (see the Water Availability section below for more details). The water availability analysis may indicate less water is available than the initial recommendation. In that case, the recommending entity either modifies the magnitude and/or duration of the recommended ISF rates if the available flows will preserve the natural environment to a reasonable degree or withdraws the recommendation.

Data Collection and Analysis

In 2025, Jay Skinner with Western Resource Advocates was hired to assist CPW and CWCB in collecting R2Cross data. Jay Skinner is a retired CPW ISF Program Coordinator with extensive R2Cross experience. Mr. Skinner and CWCB staff collected R2Cross data at two transects for this proposed ISF reach (Table 2 and Site Map). Results obtained at more than one cross-section are averaged to determine the R2Cross flow rate for the stream reach. The R2Cross model results in a winter flow of 1.03 cfs and a summer flow of 2.91 cfs. R2Cross field data and model results can be found in the appendix to this report.

Table 2. Summary of R2Cross cross-section measurements and results for East Fork Roaring Creek.

Date, XS #	Top Width (feet)	Streamflow (cfs)	Winter Rate (cfs)	Summer Rate (cfs)
06/16/2025, 1	8.26	11.37	0.68	1.75
06/16/2025, 2	13.79	11.37	1.37	4.06
		Average	**1.03**	**2.91**

ISF Recommendation

CPW recommends the following flows based on R2Cross modeling analyses, biological expertise, and staff's water availability analysis.

0.6 cfs is recommended from October 1 through March 31. This flow rate is reduced due to water availability limitations but will support adequate depth in riffles and will provide sufficient areas of holding habitat in pools and glides to overwinter fish.

1.9 cfs is recommended from April 1 through April 30. This flow rate is reduced due to water availability limitations but maintains sufficient depth and wetted perimeter which will support movement of greenback cutthroat trout as they transition from overwintering habitat as snowmelt begins.

2.9 cfs is recommended from May 1 through July 31. This flow rate meets three of three hydraulic criteria and supports high flow requirements for stream health. This flow rate maintains sufficient depth, velocity, and wetted perimeter during spring runoff, and its receding limb. This flow rate supports beneficial feeding and spawning conditions for greenback cutthroat trout as they mature and grow. Increased habitat availability is beneficial during spring and summer when greenback cutthroat trout spawn and have increased activity feeding throughout the stream. This is an important period for cutthroat trout growth, maturation, and spawning.

1.5 cfs is recommended from August 1 through September 30. This flow rate is reduced due to water availability limitations. This flow rate supports sufficient depth and wetted perimeter and maintains high velocities in one cross-section. Most trout growth occurs during summer when longer days and warmer water temperatures facilitate growth. Late summer is an important period for cutthroat trout, so increased aquatic habitat availability for fish and macroinvertebrates is beneficial from early August through the end of September.

WATER AVAILABILITY

CWCB staff conducts hydrologic analyses for each recommended ISF appropriation to provide the Board with a basis for determining that water is available.

Water Availability Methodology

Each recommended ISF reach has a unique flow regime that depends on variables such as the timing, magnitude, and location of water inputs (such as rain, snow, and snowmelt) and water losses (such as diversions, reservoirs, evaporation and transpiration, groundwater recharge, etc.). This approach focuses on streamflow and the influence of flow alterations, such as diversions, to understand how much water is physically available in the recommended reach.

Staff's hydrologic analysis is data-driven, meaning that staff gathers and evaluates the best available data and uses the best available analysis method for that data. When available, long-term stream gage data (period of record 20 or more years) are used to evaluate streamflow. Other streamflow information such as short-term gages, temporary gages, spot streamflow measurements, diversion records, and regression-based models are used when long-term gage data is not available or is not representative of the recommended reach. CSUFlow18 is a multiple regression model developed by Colorado State University researchers using streamflow gage data collected between 2001 and 2018 (Eurich et al., 2021). This model estimates mean-monthly streamflow based on drainage basin area, basin terrain variables, and

average basin precipitation and snow persistence. Diversion records are used to evaluate the effect of surface water diversions when necessary. Interviews with water commissioners, landowners, and ditch or reservoir operators can provide additional information. A range of analytical techniques may be employed to extend gage records, estimate streamflow in ungaged locations, and estimate the effects of diversions. The goal is to obtain the most detailed and reliable estimate of hydrology using the most efficient analysis technique.

The final product of the hydrologic analysis used to determine water availability is a hydrograph, which shows streamflow and the proposed ISF rate over the course of one year. The hydrograph will show median daily values when daily data is available from gage records; otherwise, it will present mean-monthly streamflow values. Staff will calculate 95% confidence intervals for the median streamflow if there is sufficient data. Statistically, there is 95% confidence that the true value of the median streamflow is located within the confidence interval.

Basin Characteristics

The contributing basin of the proposed ISF on East Fork Roaring Creek is 5.9 square miles, with an average elevation of 10,014 feet and average annual precipitation of 28.9 inches. East Fork of Roaring Creek is a snowmelt driven hydrologic system, with variable timing and magnitude in snowmelt runoff. East Fork Roaring Creek flows through a natural basin with no anthropogenic changes to streamflow. However, in August 2020 and continuing through complete containment in December 2020, portions of the contributing basin of East Fork Roaring Creek burned during the Camron Peak fire. CPW confirmed that there are areas of the stream corridor that are recovering more quickly than expected, and alterations to the hydrologic timing due to fire have mostly recovered.

Water Rights Assessment

Staff evaluated the existing absolute water rights in the basin tributary to the ISF reach that could affect streamflow in the proposed reach. There are no direct diversions from East Fork Roaring Creek. There are no exchanges within the proposed reach and there is no transbasin water leaving or entering this system.

Data Collection and Analysis

Representative Gage Analysis

There are no current or historic gages on East Fork Roaring Creek. Staff investigated nearby gages for similarities in basin characteristics and hydrology. No gages were sufficiently similar to be used to estimate streamflow on East Fork of Roaring Creek.

Multiple Regression Model

The CSUFlow18 regression model predicts mean-monthly flow in East Fork of Roaring Creek and provides the best estimate for streamflow conditions.

Site Visit Data

CWCB staff collaborated with CPW staff and CWCB contractors on R2Cross fieldwork, no other streamflow measurements were taken on the proposed reach of East Fork Roaring Creek.

Water Availability Summary

The hydrograph shows CSUFlow18 results for mean-monthly streamflow and includes the proposed ISF rate (See Complete Hydrograph). The proposed ISF flow rate is below the mean-monthly streamflow. Staff concludes that water is available for appropriation on East Fork Roaring Creek.

MATERIAL INJURY

If decreed, the proposed ISF on East Fork Roaring Creek would be a new junior water right. This ISF water right can exist without material injury to other senior water rights. Under the provisions of section 37-92-102(3)(b), C.R.S., the CWCB will

recognize any uses or exchanges of water in existence on the date this ISF water right is appropriated.

ADDITIONAL INFORMATION

Common Acronyms and Abbreviations

Term	Definition
ac-ft	acre feet
BLM	Bureau of Land Management
cfs	cubic feet per second
CWCB	Colorado Water Conservation Board
CPW	Colorado Parks and Wildlife
CRCT	Colorado River cutthroat trout
DWR	Division of Water Resources
HCCA	High Country Conservation Advocates
ISF	Instream Flow
NLL	Natural Lake Level
SWAP	State Wildlife Action Plan
USGS	United States Geological Survey
USFS	United States Forest Service
XS	Cross section

Citations

Colorado Parks and Wildlife, 2025, State Wildlife Action Plan: A strategy for conserving wildlife in Colorado. https://cpw.widencollective.com/assets/share/asset/nbenjdfemj

Colorado Water Conservation Board, 2022, R2Cross model- User's manual and technical guide. https://r2cross.erams.com/

Colorado Water Conservation Board, 2024, R2Cross field manual. https://dnrweblink.state.co.us/cwcbsearch/0/edoc/224685/R2Cross%20Field%20Manual%202024.pdf

Eurich, A., Kampf, S.K., Hammond, J.C., Ross, M., Willi, K., Vorster, A.G. and Pulver, B., 2021, Predicting mean annual and mean monthly streamflow in Colorado ungauged basins, River Research and Applications, 37(4), 569-578.

Ferguson, R.I., 2007. Flow resistance equations for gravel- and boulder-bed streams. Water Resources Research 43. https://doi.org/10.1029/2006WR005422

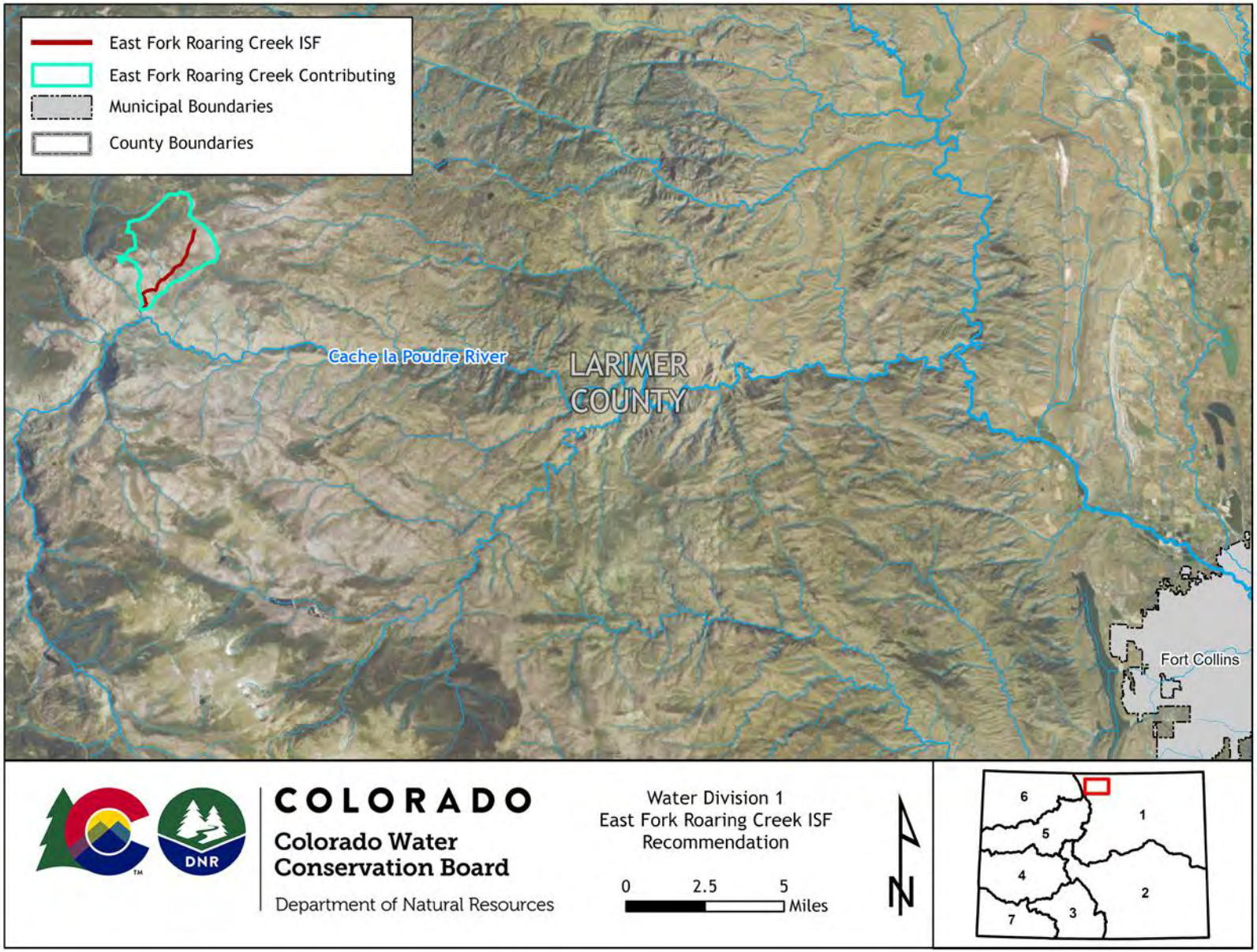
Ferguson, R.I., 2021. Roughness calibration to improve flow predictions in coarse-bed streams. Water Res 57. https://doi.org/10.1029/2021WR029979

Nehring, B.R., 1979, Evaluation of instream flow methods and determination of water quantity needs for streams in the state of Colorado, Colorado Division of Wildlife.

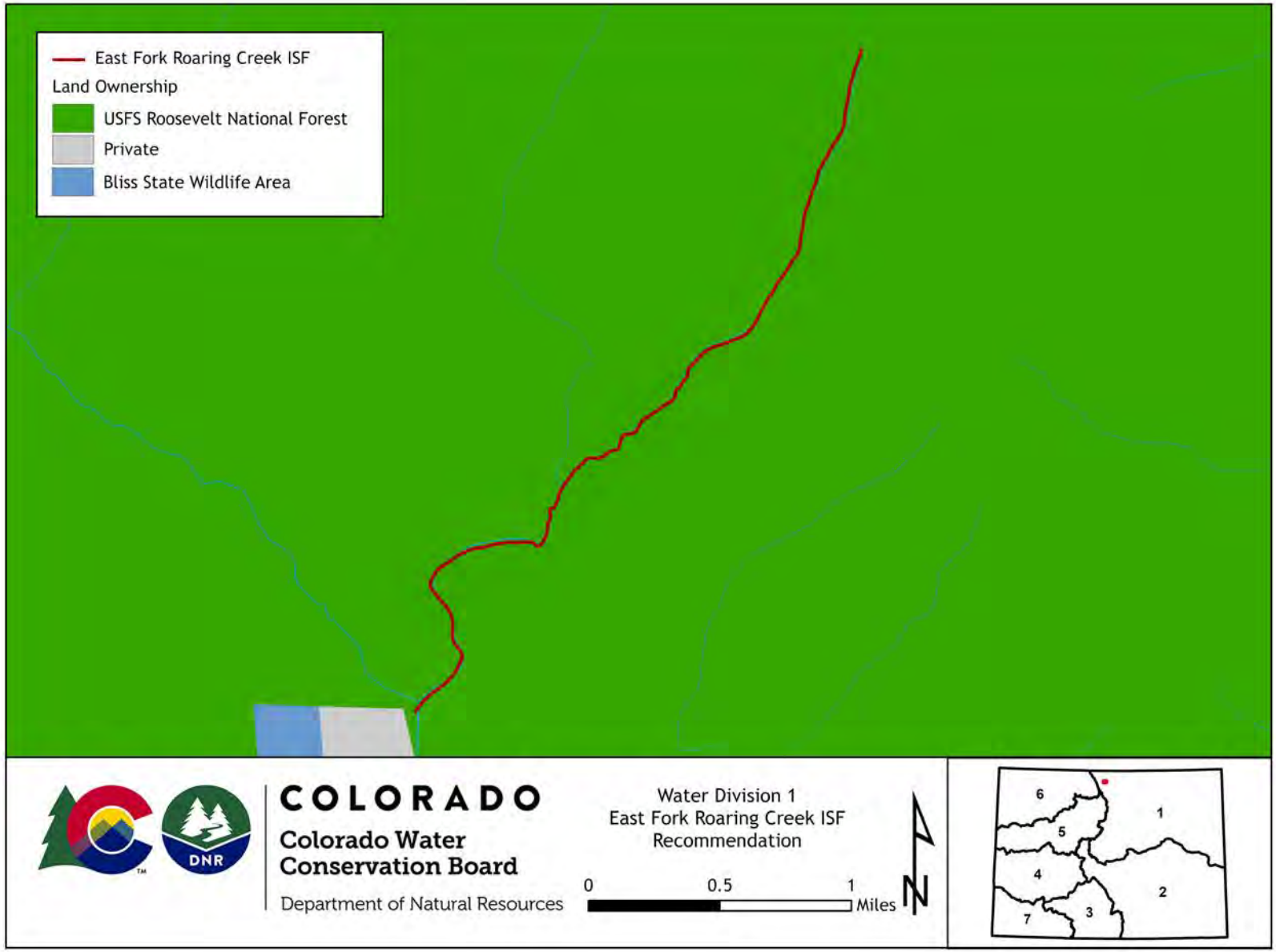
Metadata Descriptions

The UTM locations for the upstream and downstream termini were derived from CWCB GIS using the National Hydrography Dataset (NHD). Projected Coordinate System: NAD 1983 UTM Zone 13N.

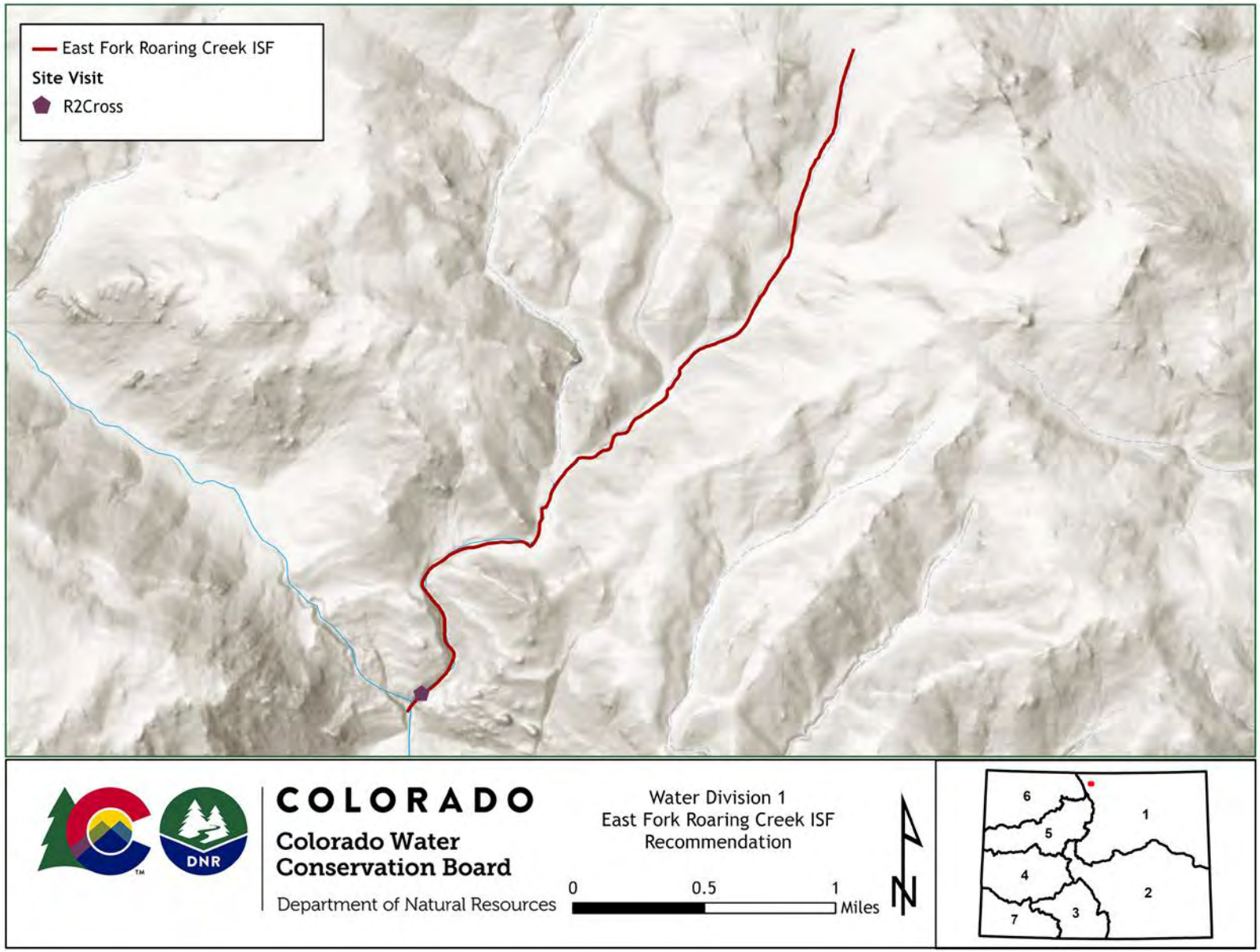
VICINITY MAP



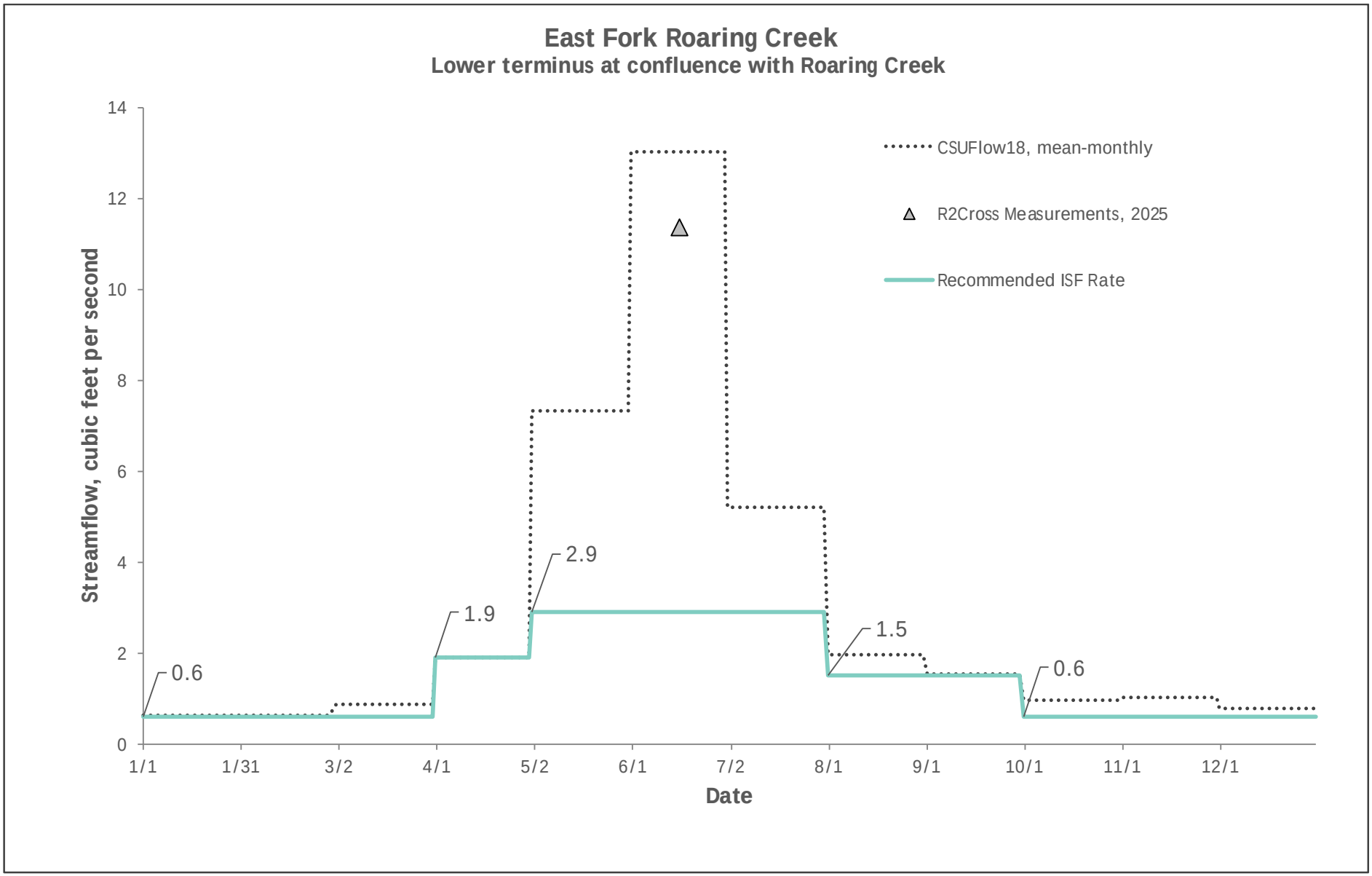
LAND OWNERSHIP MAP



SITE MAP


East Fork Roaring Creek ISF
Site Visit
R2Cross
COLORADO
Colorado Water Conservation Board
Department of Natural Resources
Water Division 1
East Fork Roaring Creek ISF
Recommendation
0
0.5
1
Miles
N
6
1
5
4
2
7
3

COMPLETE HYDROGRAPH



Cottonwood Creek Executive Summary

CWCB STAFF INSTREAM FLOW RECOMMENDATION
January 26-27, 2026

UPPER TERMINUS:	headwaters in the vicinity of UTM North: 4210367.96 UTM East: 446587.20
LOWER TERMINUS:	USFS Boundary at UTM North: 4213216.70 UTM East: 451493.06
WATER DIVISION/DISTRICT:	2/13
COUNTY:	Custer
WATERSHED:	Arkansas Headwaters
CWCB ID:	21/2/A-002
RECOMMENDER:	Colorado Parks and Wildlife (CPW)
LENGTH:	4.14 miles
FLOW RECOMMENDATION:	0.40 cfs (12/01 - 04/15) 1 cfs (04/16 - 05/16) 6.3 cfs (05/17 - 07/10) 1.7 cfs (07/11 - 08/31) 0.75 cfs (09/01 - 11/30)

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BACKGROUND

Colorado's General Assembly created the Instream Flow and Natural Lake Level Program in 1973, recognizing "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3), C.R.S.). The statute vests the Colorado Water Conservation Board (CWCB or Board) with the exclusive authority to appropriate and acquire instream flow (ISF) and natural lake level (NLL) water rights. Before initiating a water right filing, the Board must determine that: 1) there is a natural environment that can be preserved to a reasonable degree with the Board's water right if granted, 2) the natural environment will be preserved to a reasonable degree by the water available for the appropriation to be made, and 3) such environment can exist without material injury to water rights.

The information contained in this Executive Summary and the associated supporting data and analyses form the basis for staff's ISF recommendation to be considered by the Board. This Executive Summary provides sufficient information to support the CWCB findings required by ISF Rule 5i on natural environment, water availability, and material injury. Additional supporting information is located at: https://cwcb.colorado.gov/2026-isf-recommendations.

RECOMMENDED ISF REACH

CPW recommended that the CWCB appropriate an ISF water right on a reach of Cottonwood Creek at the ISF Workshop in January 2020. Cottonwood Creek is located within Custer County and is approximately seven miles southwest from the Town of Westcliffe (See Vicinity Map). The stream originates near Comanche Peak in the San de Cristo Mountains and flows northeast until it reaches the valley floor and the confluence with Alvarado Creek. Cottonwood Creek is a tributary to Alvarado Creek, a tributary to Spring Creek, a tributary to Grape Creek, which is a tributary to the Arkansas River.

The proposed ISF reach extends from the headwaters downstream to the U.S. Forest Service Boundary for a total of 4.14 miles. One-hundred percent of the land on the proposed reach is public lands managed by the U.S. Forest Service as part of the Pike and San Isabel National Forests/Cimarron and Comanche National Grasslands (See Land Ownership Map). CPW is recommending ISF protection on this stream to preserve the natural environment and to fulfill CPW's statutory charge that fish and wildlife resources and their environment should be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors. Securing an ISF water right on this reach will assist in protecting the fishery and conserving fish habitat in alignment with CPW's statutory directive and strategic planning documents. Specifically, this stream supports Hayden Creek cutthroat trout, a subspecies of native cutthroat trout. Hayden Creek cutthroat trout are a lineage of cutthroat trout with unique genetic markers dating back to early samples collected in the Arkansas Basin. They are also considered Tier 1 Species of Greatest Conservation Need according to CPW's State Wildlife Action Plan (CPW, 2015; SWAP). CPW is committed to taking actions to preserve and protect conservation populations of these species and watershed and stream conditions they rely on.

OUTREACH

Stakeholder input is a valued part of the CWCB staff's analysis of ISF recommendations. Currently, more than 1,100 people subscribe to the ISF mailing list. Notice of the potential appropriation of an ISF water right on Cottonwood Creek was sent to the mailing list in November 2025, March 2025, March 2024, March 2023, March 2022, March 2021, and March 2020. Staff sent letters to identified landowners adjacent to Cottonwood Creek based on information from the county assessor's website. A public notice about this recommendation was also published in the Wet Mountain Tribune on December 18, 2025.

Staff presented information about the ISF program and this recommendation to the Custer County Board of County Commissioners on January 15, 2026. In addition, staff spoke with Allen Keeling, District 13 Water Commissioner, on December 16, 2025 regarding water availability and water rights on Cottonwood Creek.

NATURAL ENVIRONMENT

CWCB staff relies on the recommending entity to provide information about the natural environment. In addition, staff reviews information and conducts site visits for each recommended ISF appropriation. This information provides the Board with a basis for determining that a natural environment exists.

Cottonwood Creek is a first-order tributary of Alvarado Creek. The headwaters of Cottonwood Creek originate in the Sangre de Cristo Range between Comanche Peak and Fluted Peak. Once Cottonwood Creek hits the valley floor west of Westcliffe, it goes subsurface. Hydrology of the creek is driven by snowmelt runoff with perennial baseflows through the recommended reach. Cottonwood Creek is a steep, cascading stream with coarse substrate that ranges from small gravel to large cobble. Large substrate like small boulders and large woody debris in the channel provide moderately sized pools that provide good habitat for small fish. There are small pockets of gravel that provide the resident fish population with spawning habitat. Large woody debris and overhead cover is abundant.

CPW is working to establish Hayden Creek cutthroat trout in Cottonwood Creek (Table 1). Hayden Creek cutthroat trout are a unique lineage of cutthroat trout that have genetic markers which date back to early samples collected in the Arkansas Basin. As part of the recovery strategy, CPW actively stocked Hayden Creek cutthroat trout in Cottonwood Creek for the three consecutive years between 2019 and 2021. Since then, CPW has observed good survival rates among stocked fish, indicating favorable habitat conditions that support a self-sustaining population of cutthroat trout. Establishing new populations of Hayden Creek cutthroat trout and protecting the

habitat where these populations reside are critical steps to the successful recovery of the subspecies. Yellowfin cutthroat trout, which were native to the Arkansas Basin, are considered extinct; therefore, the Hayden Creek cutthroat trout is the closest analog to a native Arkansas River Basin cutthroat trout. They are also considered Tier 1 Species of Greatest Conservation Need according to CPW's State Wildlife Action Plan.

Table 1. List of species identified in Cottonwood Creek.

Species Name	Scientific Name	Status
Hayden Creek cutthroat trout	*Oncorhynchus clarkii pleuriticus*	State - Species of Greatest Conservation Need State - Species of Special Concern

ISF QUANTIFICATION

CWCB staff relies on the biological expertise of the recommending entity to quantify the amount of water required to preserve the natural environment to a reasonable degree. CWCB staff performs a thorough review of the quantification analyses completed by the recommending entity to ensure consistency with accepted standards.

Quantification Methodology

CPW staff used the R2Cross method to develop the initial ISF recommendation. The R2Cross method is based on a hydraulic model and uses field data collected in a stream riffle (CWCB, 2022; CWCB, 2024). Riffles are the stream habitat type that are most vulnerable to dry if streamflow ceases. The data collected consists of a streamflow measurement, a survey of channel geometry and features at a cross section, and a survey of the longitudinal slope of the water surface.

The R2Cross model uses Ferguson's Variable-Power Equation (VPE) to estimate roughness and hydraulic conditions at different water stages at the measured cross section (Ferguson, 2007; Ferguson, 2021). This approach is based on calibrating the

model as described in Ferguson (2021). The model is used to evaluate three hydraulic criteria: average depth, average velocity, and percent wetted perimeter. Maintaining these hydraulic parameters at adequate levels across riffle habitat types also will maintain aquatic habitat in pools and runs for most life stages of fish and aquatic macroinvertebrates (Nehring, 1979). CPW staff use the model results to develop an initial recommendation for summer and winter flows. The summer flow recommendation is based on the flow that meets all three hydraulic criteria. The winter flow recommendation is based on the flow that meets two of the three hydraulic criteria.

The R2Cross method estimates the biological amount of water needed for summer and winter periods. The recommending entity uses the R2Cross results and its biological expertise to develop an initial ISF recommendation. CWCB staff then evaluates water availability for the reach typically based on median hydrology (see the Water Availability section below for more details). The water availability analysis may indicate less water is available than the initial recommendation. In that case, the recommending entity either modifies the magnitude and/or duration of the recommended ISF rates if the available flows will preserve the natural environment to a reasonable degree or withdraws the recommendation.

Data Collection and Analysis

Jay Skinner with Western Resource Advocates was hired to assist CPW and CWCB in collecting R2Cross data. Jay Skinner is a retired CPW ISF Program Coordinator with extensive R2Cross experience. Mr. Skinner and CWCB staff collected data at five transects for this proposed ISF reach (Table 2 and Site Map). Results obtained at more than one cross section are averaged to determine the R2Cross flow rate for the stream reach. The R2Cross model results in a winter flow of 1.56 cfs and a summer flow of 6.27 cfs. R2Cross field data and model results can be found in the appendix to this report.

Table 2. Summary of R2Cross cross-section measurements and results for Cottonwood Creek.

Date, XS #	Top Width (feet)	Streamflow (cfs)	Winter Rate (cfs)	Summer Rate (cfs)
06/10/2025, 1	11.90	10.69	0.91	4.07
06/10/2025, 2	21.50	10.69	4.80	13.97
06/10/2025, 3	13.50	10.69	0.39	5.86
06/10/2025, 4	15.40	10.69	1.38	1.95
06/10/2025, 5	13.60	10.69	0.34	5.52
		Average	**1.56**	**6.27**

ISF Recommendation

CPW recommends the following flows based on R2Cross modeling analyses, biological expertise, and staff's water availability analysis.

0.40 cfs is recommended from December 1 through April 15. This flow rate has been reduced due to water availability constraints but will still support adequate habitat availability and will provide sufficient areas of holding habitat in pools and glides to support overwintering fish.

1.0 cfs is recommended from April 16 through May 16**.** This flow rate was reduced due to limited water availability but will maintain sufficient depth and wetted perimeter criteria, and high velocities (less than 1.0 fps). This will support movement of CRCT as they transition from overwintering conditions as snowmelt begins. The inclusion of this early spring flow target also recognizes that earlier spring runoff may become a reality in a changing climate.

6.3 cfs is recommended from May 17 through July 10. This flow rate meets three of three hydraulic criteria. This flow rate will maintain adequate depth, velocity, and wetted perimeter criteria during spring runoff, its receding limb, and early summer.

This flow rate supports beneficial feeding and spawning conditions for cutthroat trout as they mature and grow. Cutthroat trout exhibit increased activity during the summer, resulting in heightened metabolic activity. This flow rate provides sufficient aquatic habitat which is beneficial for both fish and macroinvertebrates.

1.7 cfs is recommended from July 11 through August 31. This flow rate was limited by water availability but will support sufficient depth and wetted perimeter, as well as moderately high velocities (less than 1.0 fps). Most trout growth occurs during summer when longer days and warmer water temperatures facilitate growth. Late summer is a crucial period for cutthroat trout, making increased aquatic habitat availability beneficial for fish and macroinvertebrates from late July through August.

0.75 cfs is recommended from September 1 through November 30. This flow rate has been reduced due to water availability constraints but will support adequate wetted perimeter and habitat availability in deep habitat features like glides and pools.

WATER AVAILABILITY

CWCB staff conducts hydrologic analyses for each recommended ISF appropriation to provide the Board with a basis for determining that water is available.

Water Availability Methodology

Each recommended ISF reach has a unique flow regime that depends on variables such as the timing, magnitude, and location of water inputs (such as rain, snow, and snowmelt) and water losses (such as diversions, reservoirs, evaporation and transpiration, groundwater recharge, etc.). This approach focuses on streamflow and the influence of flow alterations, such as diversions, to understand how much water is physically available in the recommended reach.

Staff's hydrologic analysis is data-driven, meaning that staff gathers and evaluates the best available data and uses the best available analysis method for that data. When

available, long-term stream gage data (period of record 20 or more years) are used to evaluate streamflow. Other streamflow information such as short-term gages, temporary gages, spot streamflow measurements, diversion records, and regression-based models are used when long-term gage data is not available or is not representative of the recommended reach. CSUFlow18 is a multiple regression model developed by Colorado State University researchers using streamflow gage data collected between 2001 and 2018 (Eurich et al., 2021). This model estimates mean-monthly streamflow based on drainage basin area, basin terrain variables, and average basin precipitation and snow persistence. Diversion records are used to evaluate the effect of surface water diversions when necessary. Interviews with water commissioners, landowners, and ditch or reservoir operators can provide additional information. A range of analytical techniques may be employed to extend gage records, estimate streamflow in ungaged locations, and estimate the effects of diversions. The goal is to obtain the most detailed and reliable estimate of hydrology using the most efficient analysis technique.

The final product of the hydrologic analysis used to determine water availability is a hydrograph, which shows streamflow and the proposed ISF rate over the course of one year. The hydrograph will show median daily values when daily data is available from gage records; otherwise, it will present mean-monthly streamflow values. Staff will calculate 95% confidence intervals for the median streamflow if there is sufficient data. Statistically, there is 95% confidence that the true value of the median streamflow is located within the confidence interval.

Basin Characteristics

The contributing basin of the proposed ISF on Cottonwood Creek is 2.7 square miles, with an average elevation of 11,432 feet and average annual precipitation of 28.2 inches. Hydrology is snowmelt driven and natural in the proposed reach.

Water Rights Assessment

Staff evaluated the existing absolute water rights in the basin tributary to the ISF reach that could affect streamflow in the proposed reach. Staff did not identify any water rights in the basin that could affect streamflow in the proposed reach. There are no exchanges within the proposed reach and there is no transbasin water leaving or entering this system

Data Collection and Analysis

Representative Gage Analysis

There is not a current or historic streamflow gage on Cottonwood Creek. The closest gage identified was the historic Middle Taylor Creek near Westcliffe, CO gage (USGS 07094900). The gage was located approximately 4 miles northwest from the proposed lower terminus on a similarly oriented drainage basin. The gage had an intermittent period of record from 8/1/1974 to 9/30/1985, with a gap from 1979 through 1983. The drainage basin of the Middle Taylor Creek gage was 3.2 square miles, with an average elevation of 11,521 ft and average annual precipitation of 33.5 inches. The USGS also operated the historic South Colony Creek near Westcliffe, CO gage (USGS 07094600). This gage was located slightly farther away and had fewer years of record, so was not used for further analysis.

The Middle Taylor Creek gage record was compared to a nearby climate station to evaluate how the historical record compares to a longer record. The closest climate station was located approximately 6.5 miles to the northeast in Westcliffe, CO (USC00058931 WESTCLIFFE, CO US). Daily precipitation data was downloaded from 1/1/1974 to 12/31/2024 through the NOAA Climate Data Center. Years with complete data sets from 1994 to 2024 were used to evaluate recent precipitation conditions (1995 and 2012 were omitted due to partial datasets). Over the Middle Taylor Creek gage record with nearly complete data (1975-1978 and 1984-1985), four years had below average annual precipitation and two years had above average annual precipitation, 1977 was below the 25th percentile annual precipitation and 1985 was

above the 75th percentile annual precipitation. Therefore, the available gage data includes a range of climate conditions, but most of the data is during years when the precipitation in the area was less than average.

The Middle Taylor Creek gage is downstream from a number of reservoir structures that appear on Colorado Decision Support System's Mapviewer. These structures do not have diversion records, water rights, or any associated information. The Water Commissioner, Allen Keeling was consulted, and he believes these are natural ponds rather than decreed water rights (12/16/2025). The Middle Taylor Creek gage was used to calculate the median daily streamflow which was prorated by 0.84 based on a weighted-area precipitation method to estimate streamflow at the lower terminus of Cottonwood Creek. This analysis shows that water is available for the flow rates requested.

Site Visit Data

CWCB staff collaborated with CPW staff and CWCB contractors on R2Cross fieldwork, no other streamflow measurements were taken on the proposed reach of Cottonwood Creek.

Water Availability Summary

The hydrograph shows the prorated median daily streamflow for the proposed reach and the proposed ISF rate (See Complete Hydrograph). The proposed ISF flow rate is below the prorated median-daily streamflow. Staff concludes that water is available for appropriation on Cottonwood Creek.

MATERIAL INJURY

If decreed, the proposed ISF on Cottonwood Creek would be a new junior water right. This ISF water right can exist without material injury to other senior water rights. Under the provisions of section 37-92-102(3)(b), C.R.S., the CWCB will recognize any uses or exchanges of water in existence on the date this ISF water right is appropriated.

ADDITIONAL INFORMATION

Common Acronyms and Abbreviations

Term	Definition
ac-ft	acre feet
BLM	Bureau of Land Management
cfs	cubic feet per second
CWCB	Colorado Water Conservation Board
CPW	Colorado Parks and Wildlife
CRCT	Colorado River Cutthroat Trout
DWR	Division of Water Resources
HCCA	High Country Conservation Advocates
ISF	Instream Flow
NLL	Natural Lake Level
SWAP	State Wildlife Action Plan
USGS	United States Geological Survey
USFS	United States Forest Service
XS	Cross section

Citations

Colorado Parks and Wildlife, 2015, State Wildlife Action Plan: A strategy for conserving wildlife in Colorado. https://cpw.widencollective.com/assets/share/asset/nbenjdfemj

Colorado Water Conservation Board, 2022, R2Cross model- User's manual and technical guide. https://r2cross.erams.com/

Colorado Water Conservation Board, 2024, R2Cross field manual. https://dnrweblink.state.co.us/cwcbsearch/0/edoc/224685/R2Cross%20Field%20Manual%202024.pdf

Eurich, A., Kampf, S.K., Hammond, J.C., Ross, M., Willi, K., Vorster, A.G. and Pulver, B., 2021, Predicting mean annual and mean monthly streamflow in Colorado ungauged basins, River Research and Applications, 37(4), 569-578.

Ferguson, R.I., 2007. Flow resistance equations for gravel- and boulder-bed streams. Water Resources Research 43. https://doi.org/10.1029/2006WR005422

Ferguson, R.I., 2021. Roughness calibration to improve flow predictions in coarse-bed streams. Water Res 57. https://doi.org/10.1029/2021WR029979

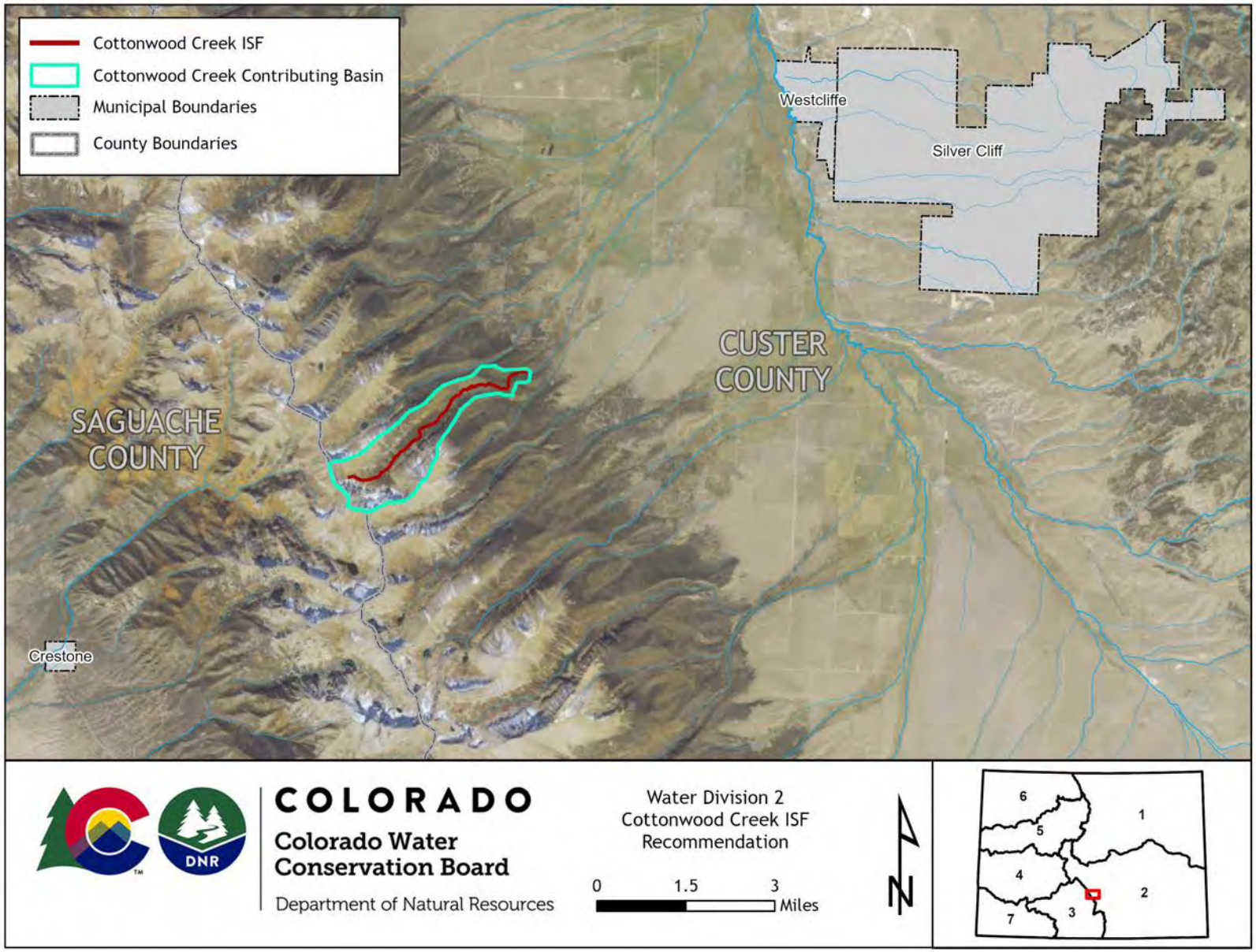
Nehring, B.R., 1979, Evaluation of instream flow methods and determination of water quantity needs for streams in the state of Colorado, Colorado Division of Wildlife.

Metadata Descriptions

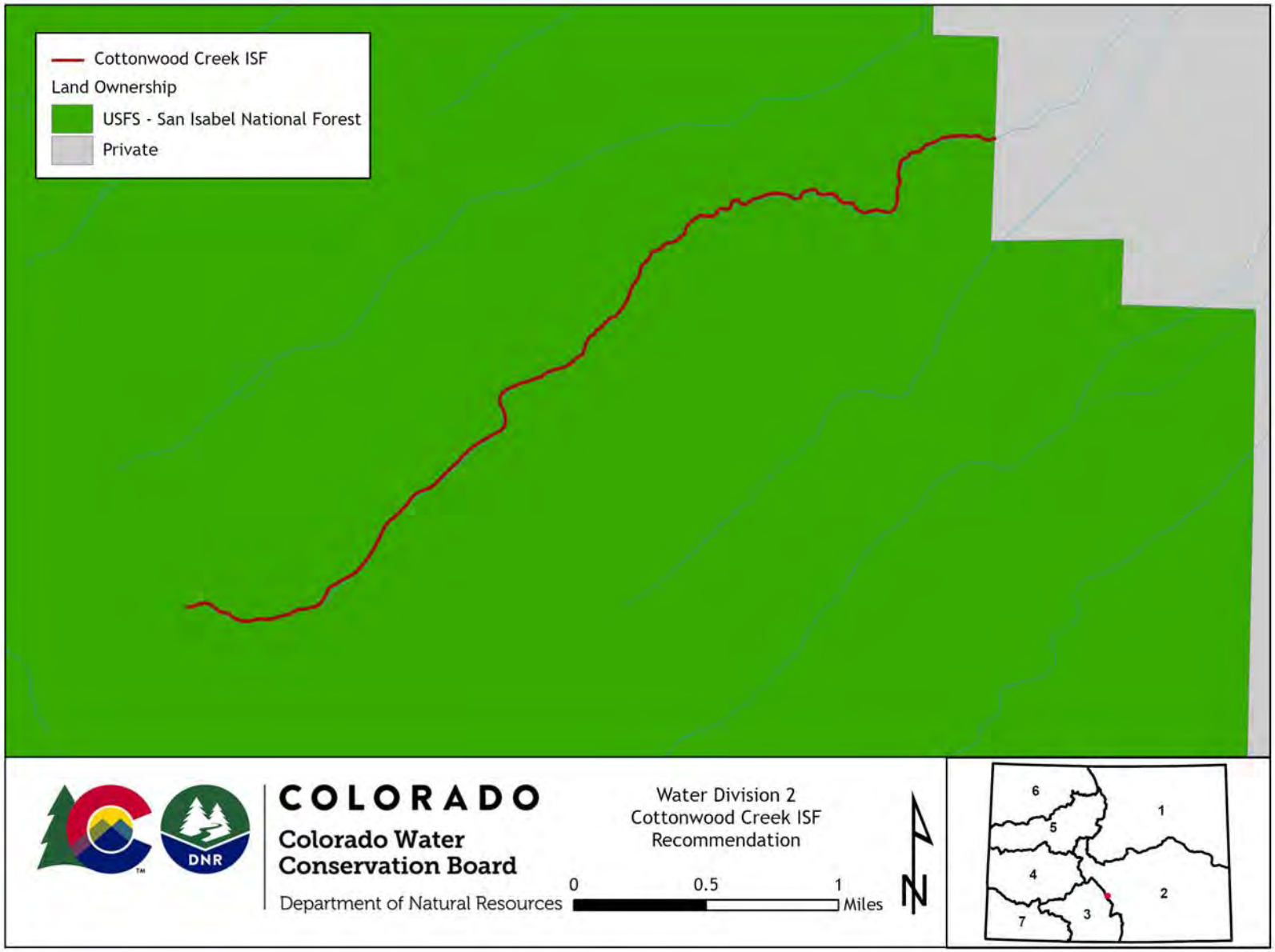
The UTM locations for the upstream and downstream termini were derived from CWCB GIS using the National Hydrography Dataset (NHD).

Projected Coordinate System: NAD 1983 UTM Zone 13N.

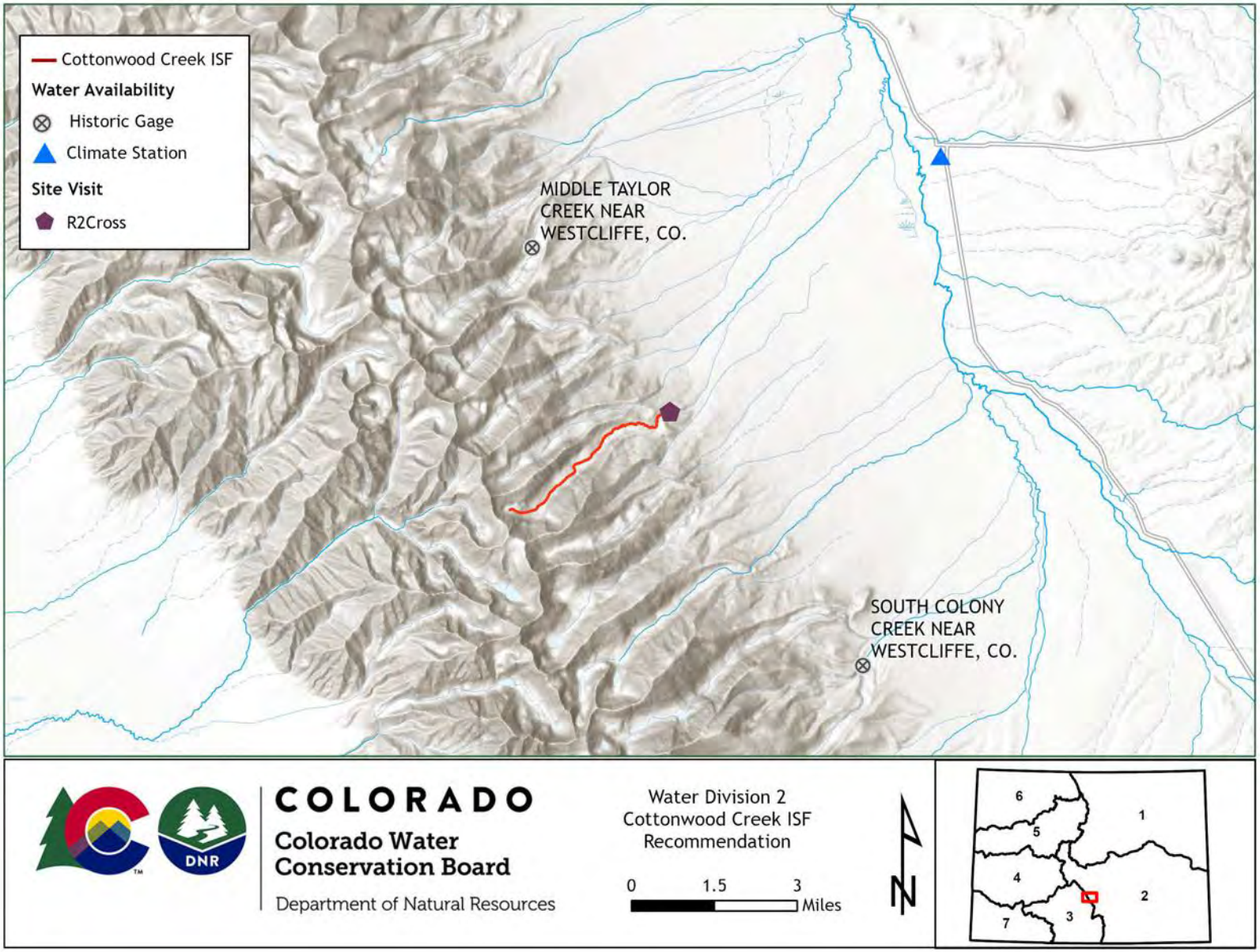
VICINITY MAP



LAND OWNERSHIP MAP



SITE MAP


Cottonwood Creek ISF
Water Availability
Historic Gage
Climate Station
Site Visit
R2Cross
MIDDLE TAYLOR CREEK NEAR WESTCLIFFE, CO.
SOUTH COLONY CREEK NEAR WESTCLIFFE, CO.
COLORADO
Colorado Water Conservation Board
Department of Natural Resources
Water Division 2
Cottonwood Creek ISF
Recommendation
0
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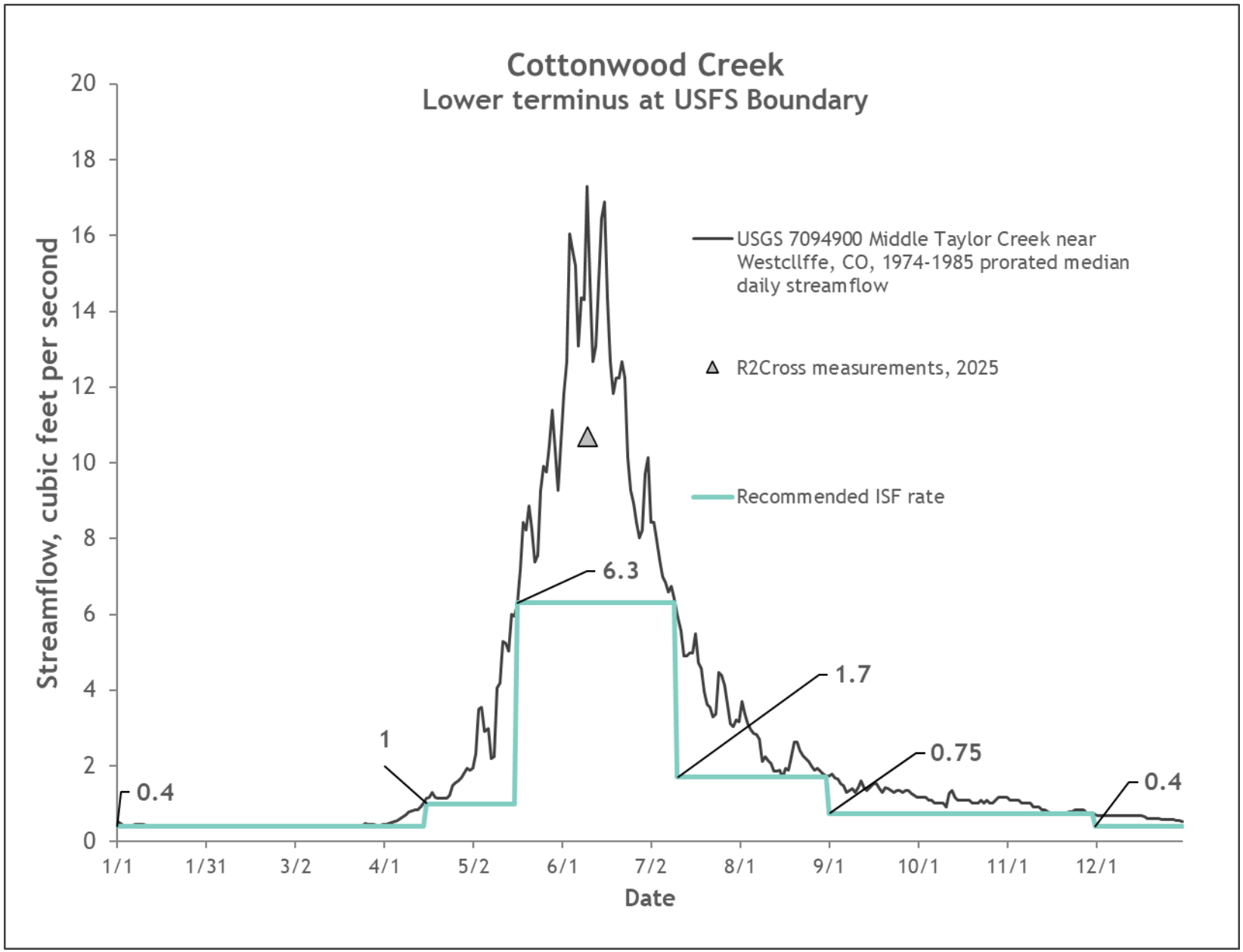
COMPLETE HYDROGRAPH



Bear Creek Executive Summary

CWCB STAFF INSTREAM FLOW RECOMMENDATION
January 26-27, 2026

UPPER TERMINUS:	headwaters in the vicinity of UTM North: 4437775.27 UTM East: 306841.61
LOWER TERMINUS:	confluence North Fork White River at UTM North: 4434888.39 UTM East: 303483.42
WATER DIVISION/DISTRICT:	6/43
COUNTY:	Garfield
WATERSHED:	Upper White
CWCB ID:	20/6/A-004
RECOMMENDER:	Colorado Parks and Wildlife (CPW)
LENGTH:	3.09 miles
FLOW RECOMMENDATION:	0.65 cfs (10/01 - 04/30) 2.9 cfs (05/01 - 07/31) 2.4 cfs (08/01 - 09/30)

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

BACKGROUND

Colorado's General Assembly created the Instream Flow and Natural Lake Level Program in 1973, recognizing "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3), C.R.S.). The statute vests the Colorado Water Conservation Board (CWCB or Board) with the exclusive authority to appropriate and acquire instream flow (ISF) and natural lake level (NLL) water rights. Before initiating a water right filing, the Board must determine that: 1) there is a natural environment that can be preserved to a reasonable degree with the Board's water right if granted, 2) the natural environment will be preserved to a reasonable degree by the water available for the appropriation to be made, and 3) such environment can exist without material injury to water rights.

The information contained in this Executive Summary and the associated supporting data and analyses form the basis for staff's ISF recommendation to be considered by the Board. This Executive Summary provides sufficient information to support the CWCB findings required by ISF Rule 5i on natural environment, water availability, and material injury. Additional supporting information is located at: https://cwcb.colorado.gov/2026-isf-recommendations.

RECOMMENDED ISF REACH

CPW recommended that the CWCB appropriate an ISF water right on a reach of Bear Creek at the ISF Workshop in January, 2017. Bear Creek is located within Garfield County and is approximately 31 miles east from the Town of Meeker (See Vicinity Map). The stream originates near Lost Lakes Peak and flows southwesterly until it reaches the confluence with the North Fork White River. Bear Creek is a tributary to the North Fork White River which is a tributary to the White River.

The proposed ISF reach extends from the headwaters downstream to confluence with the North Fork White River for a total of 3.09 miles. Almost the entire reach, around

90%, is on the White River National Forest and most of the basin is part of the Flat Tops Wilderness Area, with the lower terminus of the proposed reach on the Rio Blanco Ranch (See Land Ownership Map). CPW is recommending an ISF protection on this stream to preserve the natural environment and to fulfill CPW's statutory charge that fish and wildlife resources and their environment should be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors. Securing an ISF water right on this reach will assist in protecting the fishery and conserving fish habitat in alignment with CPW's statutory directive and strategic planning documents.

OUTREACH

Stakeholder input is a valued part of the CWCB staff's analysis of ISF recommendations. Currently, more than 1,100 people subscribe to the ISF mailing list. Notice of the potential appropriation of an ISF water right on Bear Creek was sent to the mailing list in November 2025, March 2025, March 2024, March 2023, March 2022, March 2021, March 2020, November 2019, and March 2019. As this reach is largly within the White River National Forest boundary, the Unites States Forest Service was notified of this recommendation on August 25, 2025. A public notice about this recommendation was also published in the Rifle Citizens Telegram on December 16, 2025.

Staff presented information about the ISF program and this recommendation to the Garfield County Board of County Commissioners on November 10, 2025. In addition, staff spoke with Betty Kract, District 43 Lead Water Commissioner, on October 7, 2025 regarding water availability on Bear Creek. Ms Kract confirmed CWCB staff's understanding of water administration in the Bear Creek catchment area. Finally, staff was in consistent communication with Josh Halstead, the General Manager of Rio Blanco Ranch, to better understand water use practices. Bear Creek terminates on Rio Blanco Ranch and Mr. Halstead is supportive of the protection this recommendation might offer the fisheries that Rio Blanco Ranch utilizes.

NATURAL ENVIRONMENT

CWCB staff relies on the recommending entity to provide information about the natural environment. In addition, staff reviews information and conducts site visits for each recommended ISF appropriation. This information provides the Board with a basis for determining that a natural environment exists.

Bear Creek is a tributary of the North Fork of the White River with headwaters in the Flat Tops Wilderness. The stream's hydrology is influenced by snowmelt runoff and stable baseflows following the runoff. The watershed is comprised of densely forested land cover containing stands of aspen, lodgepole pine, spruce, and conifer. Bear Creek supports a healthy riparian area with abundant plants and mosses. Upland and riparian communities support ample overhead cover and shading of the stream. Bear Creek is a first to second order stream that is moderate to high gradient. The channel type is typical of a headwaters stream with an entrenched V-shaped channel and large substrate that ranges from coarse gravels to small boulders. Large substrate in the channel creates pocket pool habitat for fish. The channel is mainly single thread with some side channel formation. There is considerable large wood in the creek, which supports habitat complexity, shading, and nutrient cycling. Much of the aquatic habitat observed by CPW staff includes high gradient riffles, cascades, and pool features that offer good holding habitat. Fish sampling conducted by CPW in 2015 indicates the stream supports a brook trout fishery (Table 1).

Table 1. List of species identified in Bear Creek.

Species Name	Scientific Name	Status
brook trout	*Salvelinus fontinalis*	None

ISF QUANTIFICATION

CWCB staff relies on the biological expertise of the recommending entity to quantify the amount of water required to preserve the natural environment to a reasonable degree. CWCB staff performs a thorough review of the quantification analyses

completed by the recommending entity to ensure consistency with accepted standards.

Quantification Methodology

CPW staff used the R2Cross method to develop the initial ISF recommendation. The R2Cross method is based on a hydraulic model and uses field data collected in a stream riffle (CWCB, 2022; CWCB, 2024). Riffles are the stream habitat type that are most vulnerable to dry if streamflow ceases. The data collected consists of a streamflow measurement, a survey of channel geometry and features at a cross section, and a survey of the longitudinal slope of the water surface.

The R2Cross model uses Ferguson's Variable-Power Equation (VPE) to estimate roughness and hydraulic conditions at different water stages at the measured cross section (Ferguson, 2007; Ferguson, 2021). This approach is based on calibrating the model as described in Ferguson (2021). The model is used to evaluate three hydraulic criteria: average depth, average velocity, and percent wetted perimeter. Maintaining these hydraulic parameters at adequate levels across riffle habitat types also will maintain aquatic habitat in pools and runs for most life stages of fish and aquatic macroinvertebrates (Nehring, 1979). CPW staff use the model results to develop an initial recommendation for summer and winter flows. The summer flow recommendation is based on the flow that meets all three hydraulic criteria. The winter flow recommendation is based on the flow that meets two of the three hydraulic criteria.

The R2Cross method estimates the biological amount of water needed for summer and winter periods. The recommending entity uses the R2Cross results and its biological expertise to develop an initial ISF recommendation. CWCB staff then evaluates water availability for the reach typically based on median hydrology (see the Water Availability section below for more details). The water availability analysis may indicate less water is available than the initial recommendation. In that case, the

recommending entity either modifies the magnitude and/or duration of the recommended ISF rates if the available flows will preserve the natural environment to a reasonable degree or withdraws the recommendation.

Data Collection and Analysis

CPW collected R2Cross data at two transects for this proposed ISF reach (Table 2 and Site Map). Results obtained at more than one cross section are averaged to determine the R2Cross flow rate for the stream reach. The R2Cross model results in a winter flow of 0.65 cfs and a summer flow of 2.85 cfs. R2Cross field data and model results can be found in the appendix to this report.

Table 2. Summary of R2Cross cross-section measurements and results for Bear Creek.

Date, XS #	Top Width (feet)	Streamflow (cfs)	Winter Rate (cfs)	Summer Rate (cfs)
08/01/2018, 1	10.06	1.60	0.96	2.47
08/01/2018, 2	8.85	1.60	0.34	3.23
		Average	**0.65**	**2.85**

ISF Recommendation

CPW recommends the following flows based on R2Cross modeling analyses, biological expertise, and staff's water availability analysis.

0.65 cfs is recommended from October 1 through April 30. This flow rate meets two of three hydraulic criteria. This flow rate supports adequate wetted perimeter and depth in the channel to provide sufficient habitat availability and areas of holding habitat necessary to overwinter fish. Maintaining depth and wetted perimeter criteria will also support longitudinal movement of fish as they transition from overwintering habitat during the spring.

2.9 cfs is recommended from May 1 through July 31. This flow rate meets all three hydraulic criteria and supports habitat availability in riffles, pools, glides, and runs. Ample habitat availability is beneficial to fish during the summer when they are actively feeding and moving longitudinally throughout the channel.

2.4 cfs is recommended from August 1 through September 30; this flow rate is reduced due to water availability limitations though will provide adequate depth and wetted perimeter for fish passage in late summer and provides adequate velocity in cross section 1. Most trout growth occurs during summer, following peak runoff, when longer days and warmer water temperatures facilitate growth. Late summer is an important period for fish, so increased aquatic habitat availability for fish and macroinvertebrates is beneficial from August through the end of September.

WATER AVAILABILITY

CWCB staff conducts hydrologic analyses for each recommended ISF appropriation to provide the Board with a basis for determining that water is available.

Water Availability Methodology

Each recommended ISF reach has a unique flow regime that depends on variables such as the timing, magnitude, and location of water inputs (such as rain, snow, and snowmelt) and water losses (such as diversions, reservoirs, evaporation and transpiration, groundwater recharge, etc.). This approach focuses on streamflow and the influence of flow alterations, such as diversions, to understand how much water is physically available in the recommended reach.

Staff's hydrologic analysis is data-driven, meaning that staff gathers and evaluates the best available data and uses the best available analysis method for that data. When available, long-term stream gage data (period of record 20 or more years) are used to evaluate streamflow. Other streamflow information such as short-term gages, temporary gages, spot streamflow measurements, diversion records, and regression-

based models are used when long-term gage data is not available or is not representative of the recommended reach. CSUFlow18 is a multiple regression model developed by Colorado State University researchers using streamflow gage data collected between 2001 and 2018 (Eurich et al., 2021). This model estimates mean-monthly streamflow based on drainage basin area, basin terrain variables, and average basin precipitation and snow persistence. Diversion records are used to evaluate the effect of surface water diversions when necessary. Interviews with water commissioners, landowners, and ditch or reservoir operators can provide additional information. A range of analytical techniques may be employed to extend gage records, estimate streamflow in ungaged locations, and estimate the effects of diversions. The goal is to obtain the most detailed and reliable estimate of hydrology using the most efficient analysis technique.

The final product of the hydrologic analysis used to determine water availability is a hydrograph, which shows streamflow and the proposed ISF rate over the course of one year. The hydrograph will show median daily values when daily data is available from gage records; otherwise, it will present mean-monthly streamflow values. Staff will calculate 95% confidence intervals for the median streamflow if there is sufficient data. Statistically, there is 95% confidence that the true value of the median streamflow is located within the confidence interval.

Basin Characteristics

The contributing basin of the proposed ISF on Bear Creek is 3.3 square miles, with an average elevation of 9,912 feet and average annual precipitation of 34.1 inches. Hydrology is largely natural and snowmelt driven with stable baseflows following spring runoff. Upstream of the diversion structure, there is limited anthropogenic change to streamflow and the basin has natural streamflow.

Water Rights Assessment

Staff evaluated the existing absolute water rights in the basin tributary to the ISF reach that could affect streamflow in the proposed reach. There are no exchanges within the proposed reach and there is no transbasin water leaving or entering this system. There is only one decreed structure in the proposed reach, located near the lower terminus. The Bear Creek Ditch has two water rights, 1.08 cfs and 2.52 cfs (appropriation dates 10/15/1903 and 07/01/1904, WDID 4300824).

Data Collection and Analysis

Representative Gage Analysis

There is not a current or historic streamflow gage on Bear Creek. The closest gage identified was the historic North Fork White River above Ripple Creek near Trappers Lake, CO gage (USGS 093202420). The gage was located approximately 0.5 miles downstream from the confluence with Bear Creek. This gage had a continuous period of record from 10/01/1965 to 9/29/1973. The drainage basin of the North Fork White River gage was 62 square miles, with an average elevation of 10,373 feet and average annual precipitation of 39 inches. A number of water uses upstream from the gage alter hydrology from natural conditions. The basin tributary to the North Fork White River gage includes 53 cfs in surface water diversions (35 cfs is a non-consumptive hydropower diversion), 0.2 cfs in wells, and 438 acre-feet of storage. This summary includes the water rights described above.

The North Fork White River gage record was compared to nearby climate stations to evaluate how the historical record compares to a recent 30 year-record. The closest climate stations with data that included the gage years and the most recent 30 years were both located approximately 33 miles to the west, in Meeker CO (USC00055487, MEEKER NO 2 and USC00055484, MEEKER 3 W). Neither climate station recorded data during the entire North Fork White River gage record. MEEKER 3 W daily precipitation data from 1/1/1965 through 9/30/1970 and MEEKER NO 2 daily precipitation data from 10/1/1970 through 12/31/1984 were combined to evaluate the full period of

record for the North Fork White River gage. Staff assumes that these two climate stations, in close proximity, provide similar information. MEEKER 3 W daily precipitation data from 1/1/1995 through 12/31/2024 was used to evaluate recent precipitation conditions.

When compared to the last 30 years, the Nork Fork White River Gage record (1965-1973) had five years with below average annual precipitation and four years with above average annual precipitation. During the POR, 1971 was below the 25th percentile for annual precipitation and 1969 was above the 90th percentile annual precipitation. Therefore, when compared to current conditions, the available gage data likely includes a wide range climate conditions

The North Fork White River gage was used to calculate the median daily streamflow which was prorated by 0.05 based on a weighted-area precipitation method to estimate streamflow at the lower terminus of Bear Creek. The median diversions from the Bear Creek Ditch were then subtracted to estimate streamflow in the proposed reach. This analysis shows that water is available for the flow rates requested.

Site Visit Data

CWCB staff observed Bear Creek in 2018 but did not make any flow measurements.

Water Availability Summary

The hydrograph shows the estimated median daily streamflow for the proposed reach, the diversion adjusted median, and the proposed ISF rate (See Complete Hydrograph). The proposed ISF flow rate is below the diversion adjusted median daily streamflow. Staff conclude that water is available for appropriation on Bear Creek.

MATERIAL INJURY

If decreed, the proposed ISF on Bear Creek would be a new junior water right. This ISF water right can exist without material injury to other senior water rights. Under

the provisions of section 37-92-102(3)(b), C.R.S., the CWCB will recognize any uses or exchanges of water in existence on the date this ISF water right is appropriated.

ADDITIONAL INFORMATION

Common Acronyms and Abbreviations

Term	Definition
ac-ft	acre feet
BLM	Bureau of Land Management
cfs	cubic feet per second
CWCB	Colorado Water Conservation Board
CPW	Colorado Parks and Wildlife
DWR	Division of Water Resources
HCCA	High Country Conservation Advocates
ISF	Instream Flow
NLL	Natural Lake Level
USGS	United States Geological Survey
USFS	United States Forest Service
XS	Cross section

Citations

Colorado Water Conservation Board, 2022, R2Cross model- User's manual and technical guide. https://r2cross.erams.com/

Colorado Water Conservation Board, 2024, R2Cross field manual. https://dnrweblink.state.co.us/cwcbsearch/0/edoc/224685/R2Cross%20Field%20Manual%202024.pdf

Eurich, A., Kampf, S.K., Hammond, J.C., Ross, M., Willi, K., Vorster, A.G. and Pulver, B., 2021, Predicting mean annual and mean monthly streamflow in Colorado ungauged basins, River Research and Applications, 37(4), 569-578.

Ferguson, R.I., 2007. Flow resistance equations for gravel- and boulder-bed streams. Water Resources Research 43. https://doi.org/10.1029/2006WR005422

Ferguson, R.I., 2021. Roughness calibration to improve flow predictions in coarse-bed streams. Water Res 57. https://doi.org/10.1029/2021WR029979

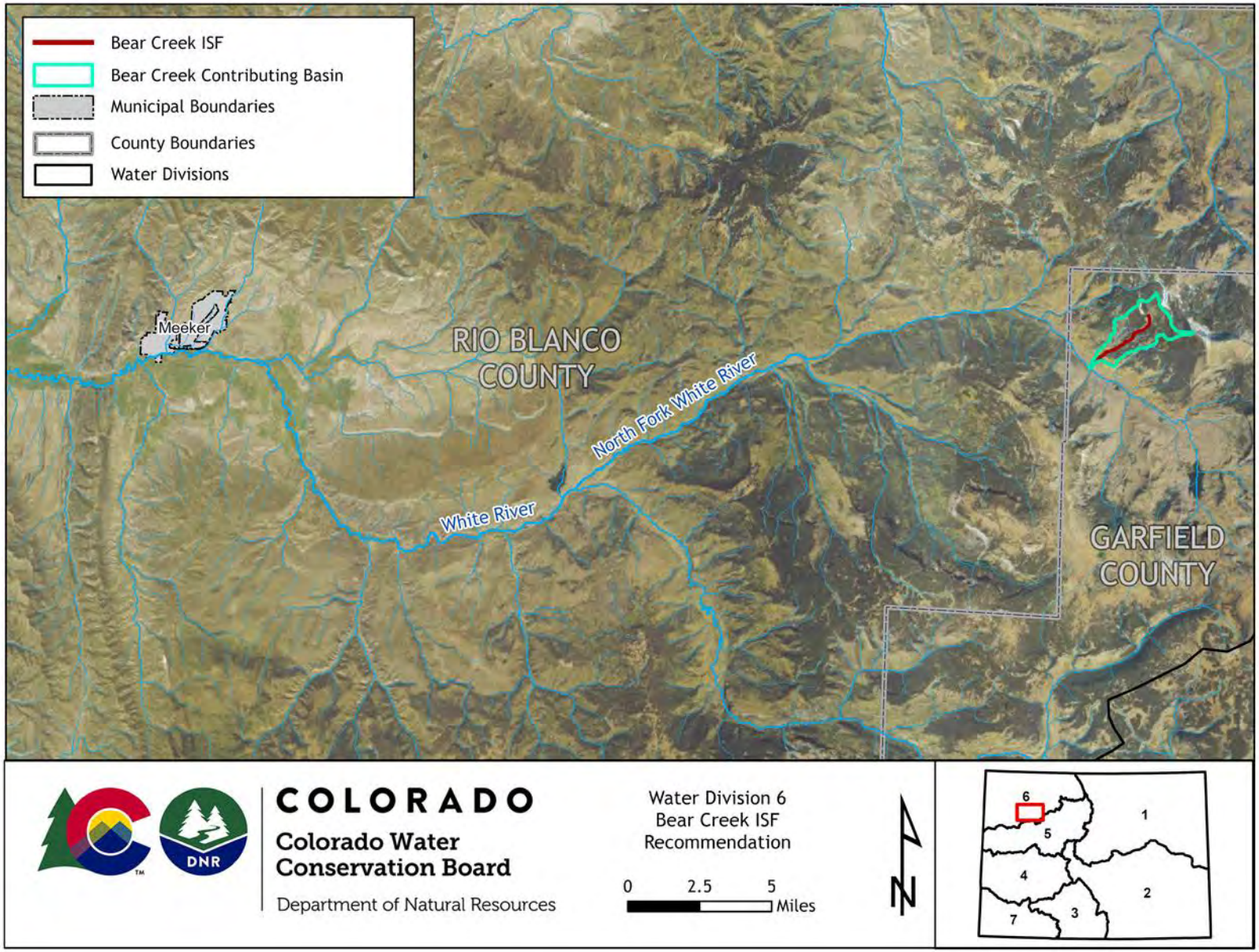
Nehring, B.R., 1979, Evaluation of instream flow methods and determination of water quantity needs for streams in the state of Colorado, Colorado Division of Wildlife.

Metadata Descriptions

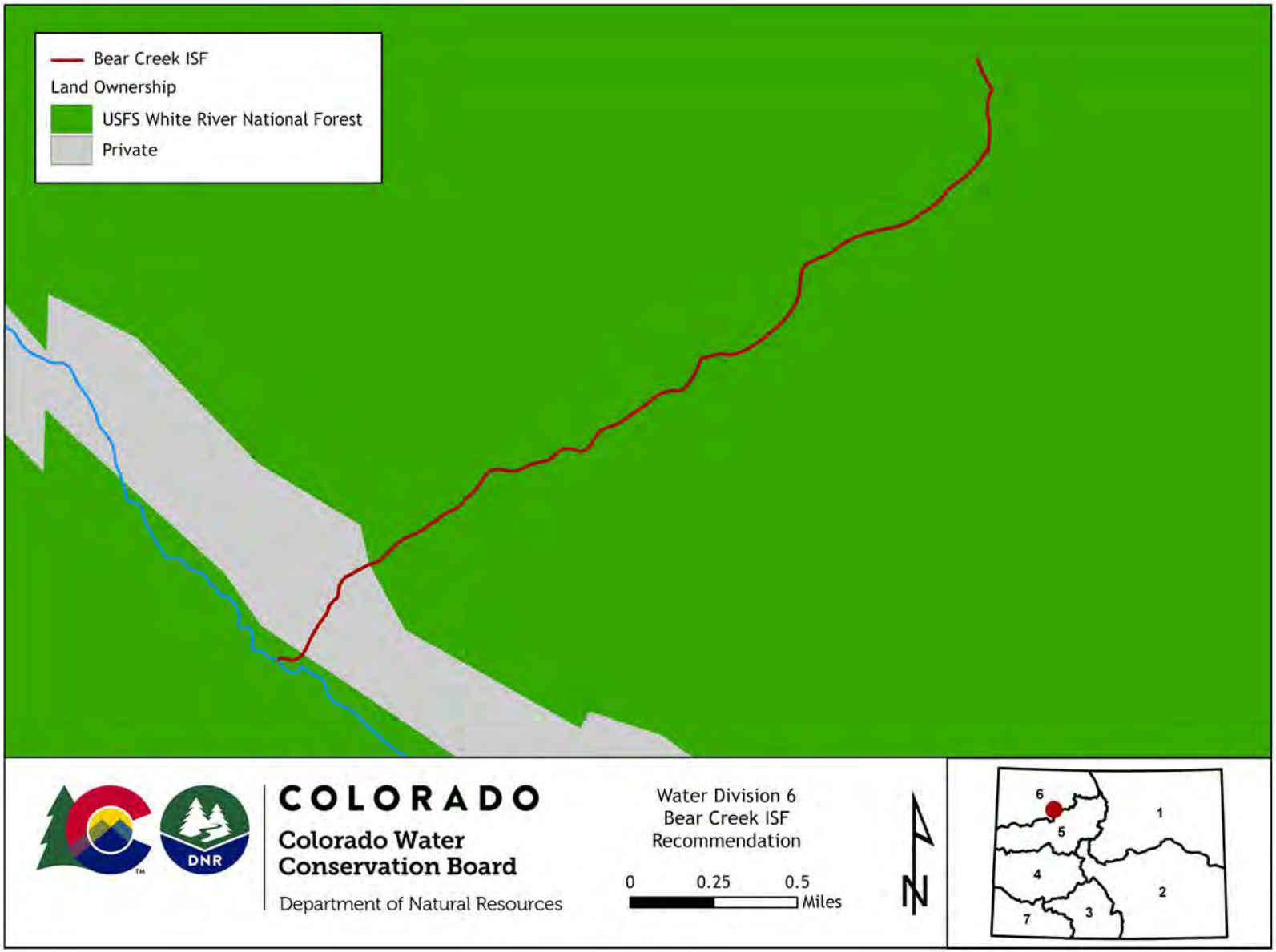
The UTM locations for the upstream and downstream termini were derived from CWCB GIS using the National Hydrography Dataset (NHD).

Projected Coordinate System: NAD 1983 UTM Zone 13N.

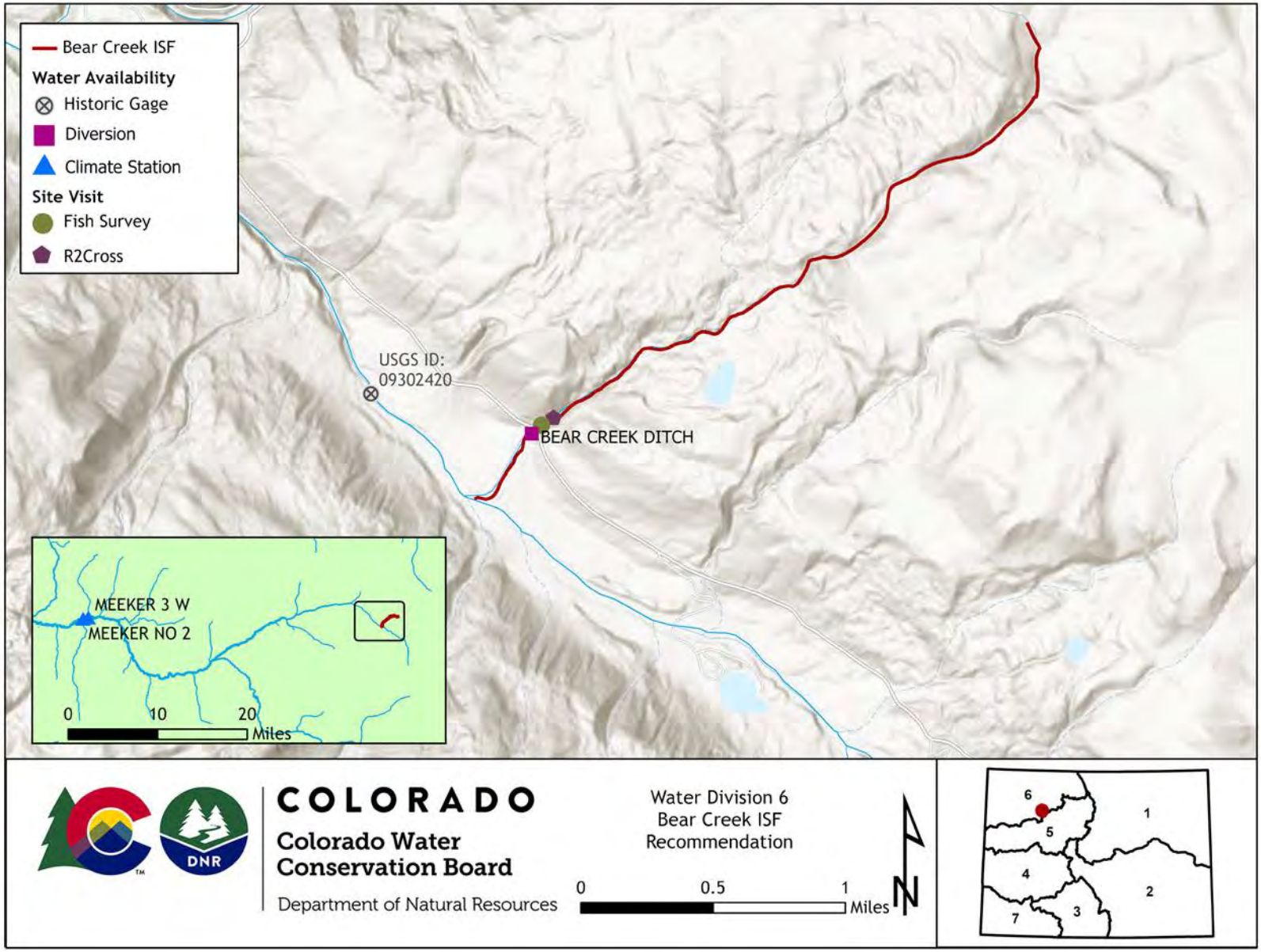
VICINITY MAP



LAND OWNERSHIP MAP



SITE MAP


Bear Creek ISF
Water Availability
Historic Gage
Diversion
Climate Station
Site Visit
Fish Survey
R2Cross
USGS ID:
09302420
BEAR CREEK DITCH
MEEKER 3 W
MEEKER NO 2
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10
20
Miles
COLORADO
Colorado Water
Conservation Board
Department of Natural Resources
Water Division 6
Bear Creek ISF
Recommendation
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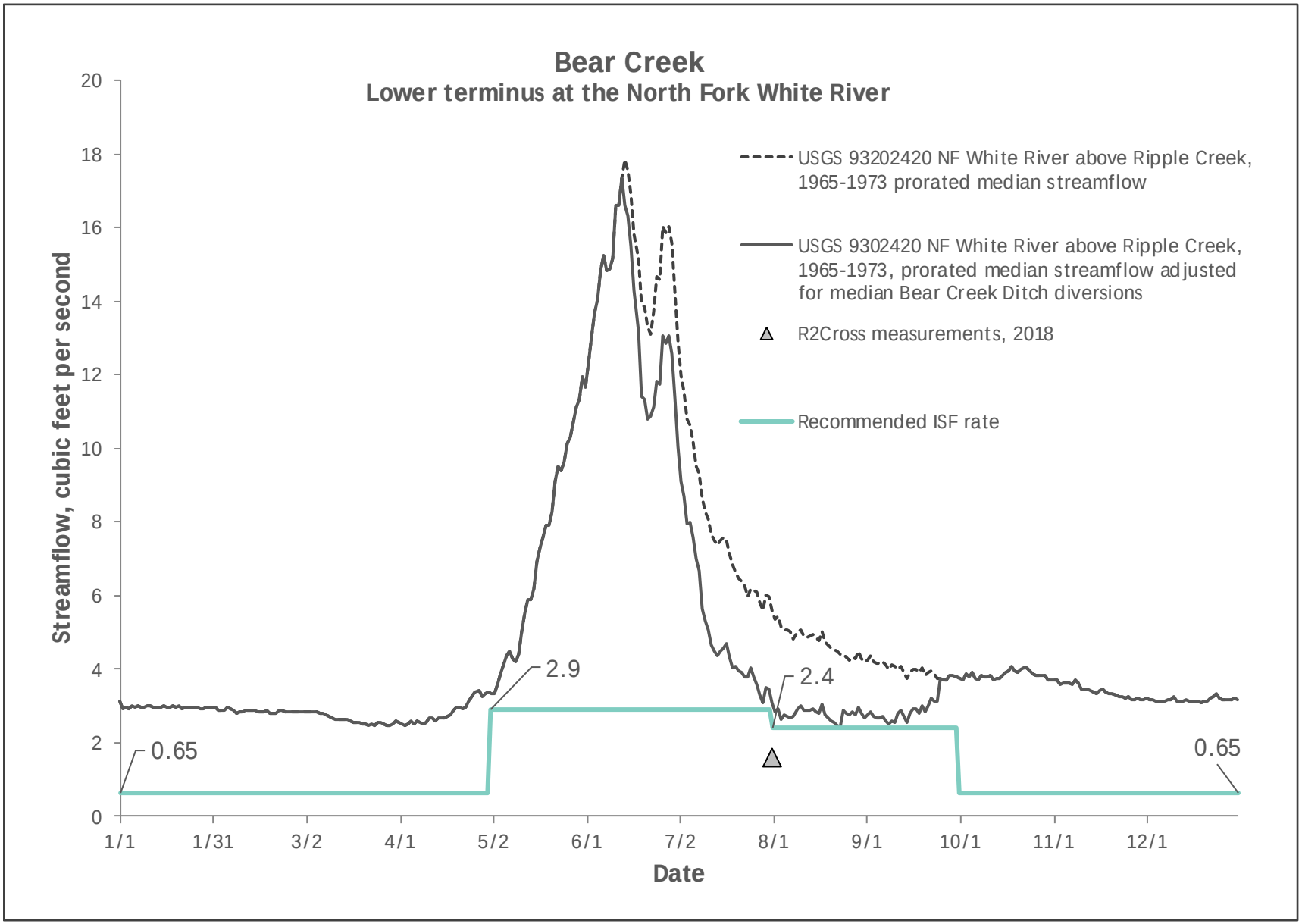
COMPLETE HYDROGRAPH



Big Fish Creek Executive Summary

CWCB STAFF INSTREAM FLOW RECOMMENDATION
January 26-27, 2026

UPPER TERMINUS:	headwaters in the vicinity of UTM North: 4427361.27 UTM East: 303972.91
LOWER TERMINUS:	confluence with North Fork White River at UTM North: 4433402.35 UTM East: 305702.92
WATER DIVISION/DISTRICT:	6/43
COUNTY:	Garfield
WATERSHED:	Upper White
CWCB ID:	20/6/A-010
RECOMMENDER:	Colorado Parks and Wildlife (CPW)
LENGTH:	4.3 miles
FLOW RECOMMENDATION:	2.3 cfs (10/01 - 03/31) 8.5 cfs (04/01 - 09/30)

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

BACKGROUND

Colorado's General Assembly created the Instream Flow and Natural Lake Level Program in 1973, recognizing "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3), C.R.S.). The statute vests the Colorado Water Conservation Board (CWCB or Board) with the exclusive authority to appropriate and acquire instream flow (ISF) and natural lake level (NLL) water rights. Before initiating a water right filing, the Board must determine that: 1) there is a natural environment that can be preserved to a reasonable degree with the Board's water right if granted, 2) the natural environment will be preserved to a reasonable degree by the water available for the appropriation to be made, and 3) such environment can exist without material injury to water rights.

The information contained in this Executive Summary and the associated supporting data and analyses form the basis for staff's ISF recommendation to be considered by the Board. This Executive Summary provides sufficient information to support the CWCB findings required by ISF Rule 5i on natural environment, water availability, and material injury. Additional supporting information is located at: https://cwcb.colorado.gov/2026-isf-recommendations.

RECOMMENDED ISF REACH

CPW recommended that the CWCB appropriate an ISF water right on a reach of Big Fish Creek at the ISF Workshop in January 2017. Big Fish Creek is located within Garfield County and is approximately 32 miles east from the Town of Meeker (See Vicinity Map). The creek originates near Gwendolen Lake and flows northeasterly until it reaches the confluence with the North Fork White River. Big Fish Creek is a tributary to the North Fork White River which is a tributary to the White River.

The proposed ISF reach extends from headwaters downstream to the confluence with the North Fork White River for a total of 4.3 miles. Approximately 96% of the land on the proposed reach is on the White River National Forest and most of the basin is part of the Flat Tops Wilderness Area (See Land Ownership Map). Near the confluence with the North Fork White River, about four percent of the stream is on private land owned by Rio Blanco Ranch. CPW is recommending ISF protection on this creek to preserve the natural environment and to fulfill CPW's statutory charge that fish and wildlife resources and their environment should be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors. Securing an ISF water right on this reach will assist in protecting the fishery and conserving fish habitat in alignment with CPW's statutory directive and strategic planning documents.

OUTREACH

Stakeholder input is a valued part of the CWCB staff's analysis of ISF recommendations. Currently, more than 1,100 people subscribe to the ISF mailing list. Notice of the potential appropriation of an ISF water right on Big Fish Creek was sent to the mailing list in November 2025, March 2025, March 2024, March 2023, March 2022, March 2021, March 2020, and March 2019. As this reach is largely within the White River National Forest boundary, the Unites States Forest Service was notified of this recommendation on August 25, 2025. A public notice about this recommendation was also published in the Rifle Citizens Telegram on December 16, 2025.

Staff presented information about the ISF program and this recommendation to the Garfield County Board of County Commissioners on November 10, 2025. In addition, staff spoke with Betty Kract, District 43 Lead Water Commissioner, on October 7, 2025 regarding water availability on Big Fish Creek. Ms. Kract confirmed staff's understanding of water administraion in the Big Fish Creek watershed. Finally, staff was in consistent communication with Josh Halstead, the General Manager of Rio Blanco Ranch, to better understand water use practices. Big Fish Creek terminates on

Rio Blanco Ranch and Mr. Halstead is supportive of the protection this recommendation might offer the fisheries that Rio Blanco Ranch utilizes.

NATURAL ENVIRONMENT

CWCB staff relies on the recommending entity to provide information about the natural environment. In addition, staff reviews information and conducts site visits for each recommended ISF appropriation. This information provides the Board with a basis for determining that a natural environment exists.

Big Fish Creek's hydrology is influenced by snowmelt runoff with stable baseflows within a densely forested watershed containing stands of aspen, lodgepole pine, spruce, and conifer. Big Fish Creek supports a healthy riparian area with very good overhead shading. Big Fish Creek is a first to third order stream that is moderately high gradient. The channel through the reach is mainly single thread. Substrate size predominantly ranges from fine gravel to medium-sized cobble. There are some large cobble and boulder substrate features, which support deep pools, and pockets which lend to cover habitat used by fish. There is considerable large wood in the channel, which supports complexity, additional shading, and nutrient cycling in the channel. The reach has a mixture of riffles, runs, glides, and pools.

Fish sampling conducted by CPW in 2008 and 2017 indicates a fishery consisting of brook trout, rainbow trout, rainbow cutthroat trout hybrid, and native mottled sculpin (Table 1). Biologist notes indicate that most fish captured were large (greater than 12 inches) and density was high. Notes also indicate habitat is excellent.

Table 1. List of species identified in Big Fish Creek.

Species Name	Scientific Name	Status
brook trout	*Salvelinus fontinalis*	None
rainbow x cutthroat	*Oncorhynchus mykiss*	None
rainbow trout	*Oncorhynchus mykiss*	None
mottled sculpin	*Cottus bairdii*	None

ISF QUANTIFICATION

CWCB staff relies on the biological expertise of the recommending entity to quantify the amount of water required to preserve the natural environment to a reasonable degree. CWCB staff performs a thorough review of the quantification analyses completed by the recommending entity to ensure consistency with accepted standards.

Quantification Methodology

CPW staff used the R2Cross method to develop the initial ISF recommendation. The R2Cross method is based on a hydraulic model and uses field data collected in a stream riffle (CWCB, 2022; CWCB, 2024). Riffles are the stream habitat type that are most vulnerable to dry if streamflow ceases. The data collected consists of a streamflow measurement, a survey of channel geometry and features at a cross-section, and a survey of the longitudinal slope of the water surface.

The R2Cross model uses Ferguson's Variable-Power Equation (VPE) to estimate roughness and hydraulic conditions at different water stages at the measured cross-section (Ferguson, 2007; Ferguson, 2021). This approach is based on calibrating the model as described in Ferguson (2021). The model is used to evaluate three hydraulic criteria: average depth, average velocity, and percent wetted perimeter. Maintaining these hydraulic parameters at adequate levels across riffle habitat types also will maintain aquatic habitat in pools and runs for most life stages of fish and aquatic macroinvertebrates (Nehring, 1979). CPW staff use the model results to develop an initial recommendation for summer and winter flows. The summer flow

recommendation is based on the flow that meets all three hydraulic criteria. The winter flow recommendation is based on the flow that meets two of the three hydraulic criteria.

The R2Cross method estimates the biological amount of water needed for summer and winter periods. The recommending entity uses the R2Cross results and its biological expertise to develop an initial ISF recommendation. CWCB staff then evaluates water availability for the reach typically based on median hydrology (see the Water Availability section below for more details). The water availability analysis may indicate less water is available than the initial recommendation. In that case, the recommending entity either modifies the magnitude and/or duration of the recommended ISF rates if the available flows will preserve the natural environment to a reasonable degree or withdraws the recommendation.

Data Collection and Analysis

CPW collected R2Cross data at two transects for this proposed ISF reach (Table 2 and Site Map). Results obtained at more than one cross-section are averaged to determine the R2Cross flow rate for the stream reach. The R2Cross model results in a winter flow of 2.31 cfs and a summer flow of 8.49 cfs. R2Cross field data and model results can be found in the appendix to this report.

Table 2. Summary of R2Cross cross-section measurements and results for Big Fish Creek.

Date, XS #	Top Width (feet)	Streamflow (cfs)	Winter Rate (cfs)	Summer Rate (cfs)
07/01/2018, 1	25.86	35.70	3.46	10.02
07/01/2018, 2	21.54	35.70	1.16	6.95
		Average	**2.31**	**8.49**

ISF Recommendation

CPW recommends the following flows based on R2Cross modeling analyses, biological expertise, and staff's water availability analysis.

2.3 cfs is recommended October 1 through March 31. This flow rate meets two of three hydraulic criteria. This flow rate supports adequate wetted perimeter and depth in the channel to provide sufficient habitat availability in areas of holding habitat necessary to overwinter fish.

8.5 cfs is recommended April 1 through September 30. This flow rate meets three of three hydraulic criteria. This flow rate supports adequate depth, velocity, and wetted perimeter, which will support habitat availability in riffles, pools, glides, and runs. Ample habitat availability is beneficial to fish during the warm season when they are active feeding and moving longitudinally throughout the channel.

WATER AVAILABILITY

CWCB staff conducts hydrologic analyses for each recommended ISF appropriation to provide the Board with a basis for determining that water is available.

Water Availability Methodology

Each recommended ISF reach has a unique flow regime that depends on variables such as the timing, magnitude, and location of water inputs (such as rain, snow, and snowmelt) and water losses (such as diversions, reservoirs, evaporation and transpiration, groundwater recharge, etc.). This approach focuses on streamflow and the influence of flow alterations, such as diversions, to understand how much water is physically available in the recommended reach.

Staff's hydrologic analysis is data-driven, meaning that staff gathers and evaluates the best available data and uses the best available analysis method for that data. When available, long-term stream gage data (period of record 20 or more years) are used to

evaluate streamflow. Other streamflow information such as short-term gages, temporary gages, spot streamflow measurements, diversion records, and regression-based models are used when long-term gage data is not available or is not representative of the recommended reach. CSUFlow18 is a multiple regression model developed by Colorado State University researchers using streamflow gage data collected between 2001 and 2018 (Eurich et al., 2021). This model estimates mean-monthly streamflow based on drainage basin area, basin terrain variables, and average basin precipitation and snow persistence. Diversion records are used to evaluate the effect of surface water diversions when necessary. Interviews with water commissioners, landowners, and ditch or reservoir operators can provide additional information. A range of analytical techniques may be employed to extend gage records, estimate streamflow in ungaged locations, and estimate the effects of diversions. The goal is to obtain the most detailed and reliable estimate of hydrology using the most efficient analysis technique.

The final product of the hydrologic analysis used to determine water availability is a hydrograph, which shows streamflow and the proposed ISF rate over the course of one year. The hydrograph will show median daily values when daily data is available from gage records; otherwise, it will present mean-monthly streamflow values. Staff will calculate 95% confidence intervals for the median streamflow if there is sufficient data. Statistically, there is 95% confidence that the true value of the median streamflow is located within the confidence interval.

Basin Characteristics

The contributing basin of the proposed ISF on Big Fish Creek is 13 square miles, with an average elevation of 10,306 feet and average annual precipitation of 39.9 inches. Hydrology is largely natural and snowmelt driven with stable baseflows following spring runoff.

Water Rights Assessment

Staff evaluated the existing absolute water rights in the basin tributary to the ISF reach that could affect streamflow in the proposed reach. There are two surface water diversions near the lower terminus, the Big Fish Creek Ditch (2.0 cfs, appropriation date 7/31/1928, WDID 4300540) and the Big Fish Ditch 1 (0.5 cfs, appropriation date 9/1/1952, WDID 4300541). The Big Fish Creek Ditch pond, which is filled by the Big Fish Creek Ditch (2 acre-feet, appropriation date 12/31/2010, WDID 4303241) is also located near the proposed lower terminus. There are no exchanges within the proposed reach and there is no transbasin water leaving or entering this system.

Data Collection and Analysis

Representative Gage Analysis

There is not a current or historic streamflow gage on Big Fish Creek. The closest gage identified was the historic North Fork White River above Ripple Creek near Trappers Lake, CO gage (USGS 093202420). The gage was located approximately 2.4 miles downstream from the confluence with Big Fish Creek. This gage had a continuous period of record from 10/01/1965 to 9/29/1973. The drainage basin of the North Fork White River gage was 62 square miles, with an average elevation of 10,373 feet and average annual precipitation of 38.6 inches. The basin tributary to the North Fork White River gage includes 53 cfs in surface water diversions (35 cfs is a non-consumptive hydropower diversion), 0.2 cfs in wells, and 438 acre-feet of storage.

The North Fork White River gage record was compared to nearby climate stations to evaluate how the historical record compares to a recent 30 year-record. The closest climate stations with data that included the gage years and the most recent 30 years were both located approximately 33 miles to the west, in Meeker CO (USC00055487, MEEKER NO 2 and USC00055484, MEEKER 3 W). Neither climate station recorded data during the entire North Fork White River gage record. MEEKER 3 W daily precipitation data from 1/1/1965 through 9/30/1970 and MEEKER NO 2 daily

precipitation data from 10/1/1970 through 12/31/1984 were combined to evaluate the full period of record for the North Fork White River gage. Staff assumes that these two climate stations, in close proximity, provide similar information. MEEKER 3 W daily precipitation data from 1/1/1995 through 12/31/2024 was used to evaluate recent precipitation conditions.

When compared to the last 30 years, the Nork Fork White River Gage record (1965-1973) had five years with below average annual precipitation and four years with above average annual precipitation. During the POR, 1971 was below the 25th percentile for annual precipitation and 1969 was above the 90th percentile annual precipitation. Therefore, when compared to current conditions, the available gage data includes a wide range of climate conditions.

The North Fork White River gage was used to calculate the median daily streamflow which was prorated by 0.22 based on a weighted-area precipitation method to estimate streamflow at the lower terminus of Big Fish Creek. The median diversions from the sum of the Big Fish Creek Ditch and the Big Fish Ditch 1 diversion records were then subtracted to estimate streamflow in the proposed reach. This analysis shows that water is available for the flow rates requested.

Site Visit Data

CWCB staff observed Big Fish Creek in 2018 but did not make any flow measurements.

Water Availability Summary

The hydrograph shows the prorated median daily streamflow for the proposed reach, the diversion adjusted median, and the proposed ISF rate (See Complete Hydrograph). The proposed ISF flow rate is below the adjusted median daily streamflow. Staff conclude that water is available for appropriation on Big Fish Creek.

MATERIAL INJURY

If decreed, the proposed ISF on Big Fish Creek would be a new junior water right. This ISF water right can exist without material injury to other senior water rights. Under the provisions of section 37-92-102(3)(b), C.R.S., the CWCB will recognize any uses or exchanges of water in existence on the date this ISF water right is appropriated.

ADDITIONAL INFORMATION

Common Acronyms and Abbreviations

Term	Definition
ac-ft	acre feet
BLM	Bureau of Land Management
cfs	cubic feet per second
CWCB	Colorado Water Conservation Board
CPW	Colorado Parks and Wildlife
DWR	Division of Water Resources
HCCA	High Country Conservation Advocates
ISF	Instream Flow
NLL	Natural Lake Level
USGS	United States Geological Survey
USFS	United States Forest Service
XS	Cross section

Citations

Colorado Water Conservation Board, 2022, R2Cross model- User's manual and technical guide. https://r2cross.erams.com/

Colorado Water Conservation Board, 2024, R2Cross field manual. https://dnrweblink.state.co.us/cwcbsearch/0/edoc/224685/R2Cross%20Field%20Manual%202024.pdf

Eurich, A., Kampf, S.K., Hammond, J.C., Ross, M., Willi, K., Vorster, A.G. and Pulver, B., 2021, Predicting mean annual and mean monthly streamflow in Colorado ungauged basins, River Research and Applications, 37(4), 569-578.

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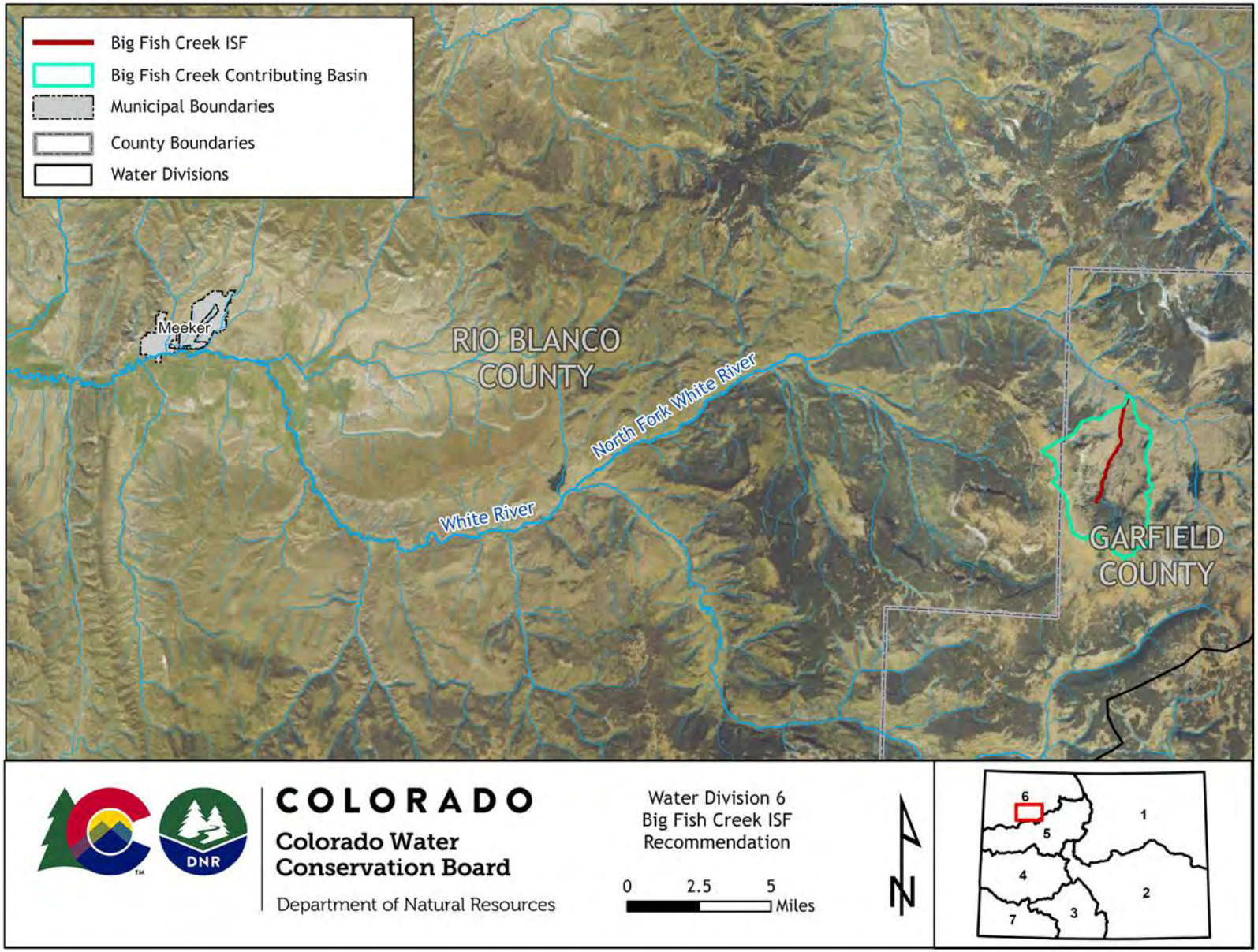
Nehring, B.R., 1979, Evaluation of instream flow methods and determination of water quantity needs for streams in the state of Colorado, Colorado Division of Wildlife.

Metadata Descriptions

The UTM locations for the upstream and downstream termini were derived from CWCB GIS using the National Hydrography Dataset (NHD).

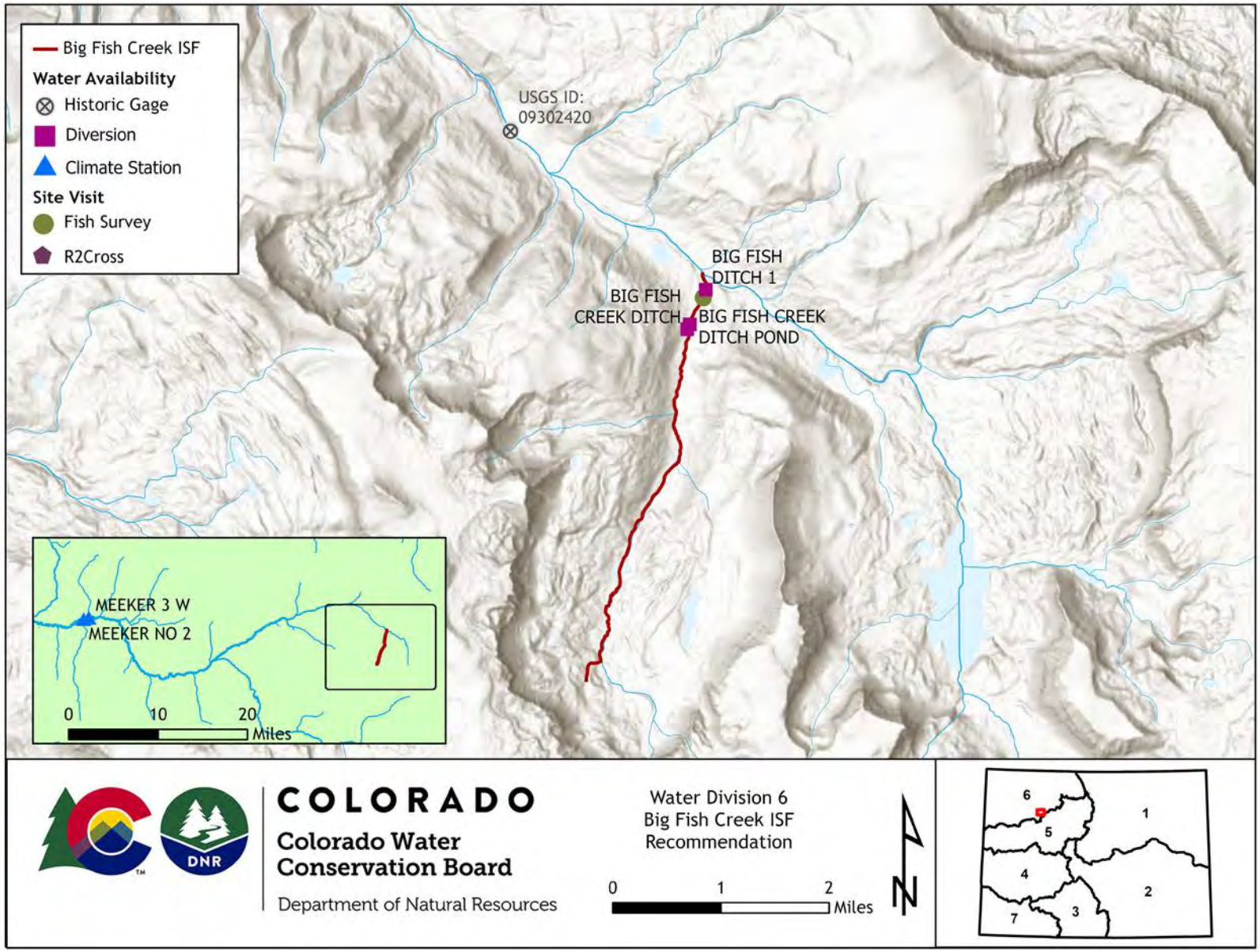
Projected Coordinate System: NAD 1983 UTM Zone 13N.

VICINITY MAP



LAND OWNERSHIP MAP

SITE MAP


Big Fish Creek ISF
Water Availability
Historic Gage
Diversion
Climate Station
Site Visit
Fish Survey
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BIG FISH
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BIG FISH
CREEK DITCH
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COLORADO
Colorado Water
Conservation Board
Department of Natural Resources
Water Division 6
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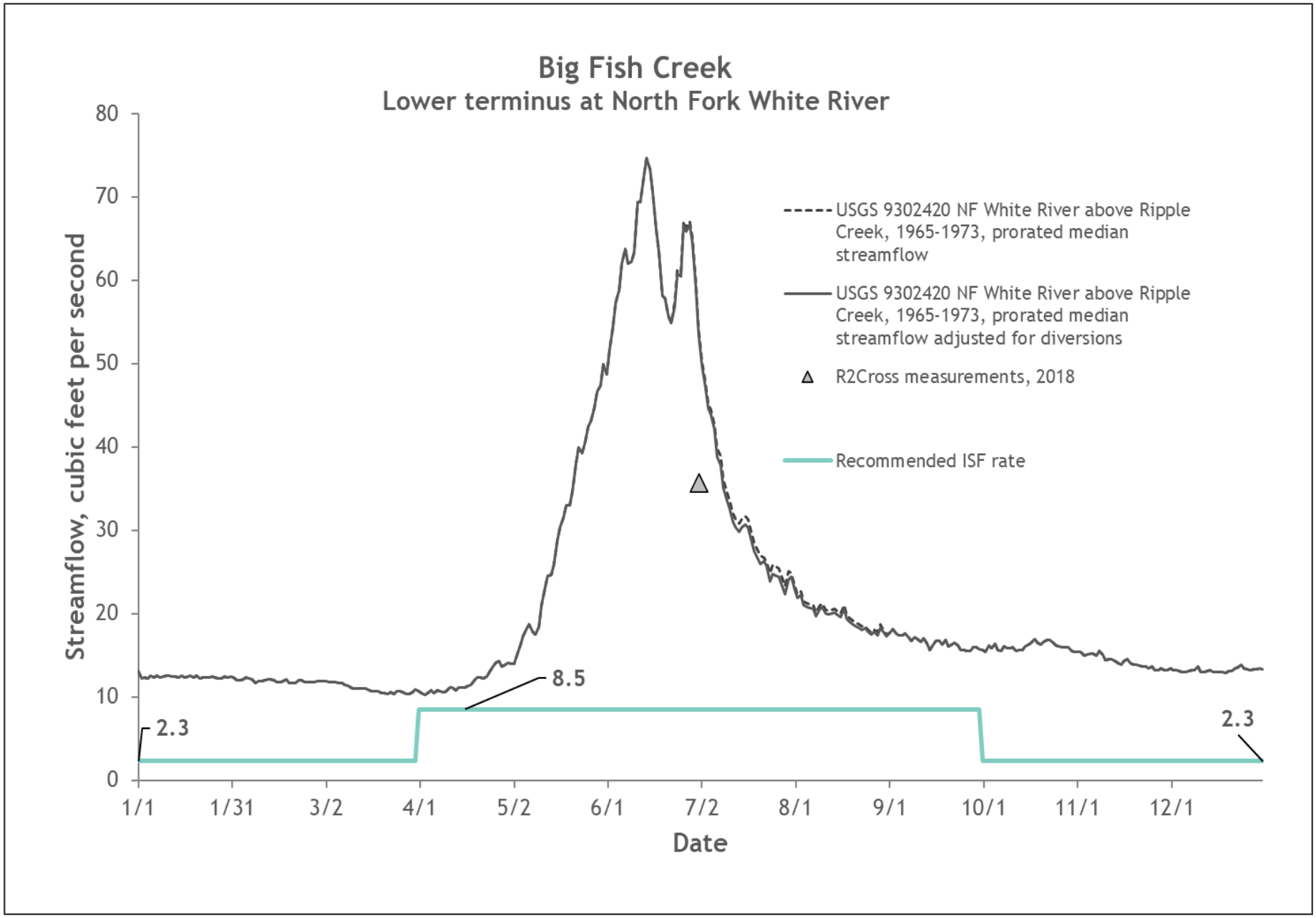
COMPLETE HYDROGRAPH



Hauskins Creek Executive Summary

CWCB STAFF INSTREAM FLOW RECOMMENDATION
January 26-27, 2026

UPPER TERMINUS:	headwaters in the vicinity of UTM North: 4435226.38 UTM East: 307883.92
LOWER TERMINUS:	confluence with North Fork White River at UTM North: 4433485.35 UTM East: 305642.92
WATER DIVISION/DISTRICT:	6/43
COUNTY:	Garfield
WATERSHED:	Upper White
CWCB ID:	18/6/A-013
RECOMMENDER:	Colorado Parks and Wildlife (CPW)
LENGTH:	2.11 miles
FLOW RECOMMENDATION:	0.65 cfs (08/01 - 05/20) 2.9 cfs (05/21 - 06/30) 0.50 cfs (07/01 - 07/31)

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

BACKGROUND

Colorado's General Assembly created the Instream Flow and Natural Lake Level Program in 1973, recognizing "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3), C.R.S.). The statute vests the Colorado Water Conservation Board (CWCB or Board) with the exclusive authority to appropriate and acquire instream flow (ISF) and natural lake level (NLL) water rights. Before initiating a water right filing, the Board must determine that: 1) there is a natural environment that can be preserved to a reasonable degree with the Board's water right if granted, 2) the natural environment will be preserved to a reasonable degree by the water available for the appropriation to be made, and 3) such environment can exist without material injury to water rights.

The information contained in this Executive Summary and the associated supporting data and analyses form the basis for staff's ISF recommendation to be considered by the Board. This Executive Summary provides sufficient information to support the CWCB findings required by ISF Rule 5i on natural environment, water availability, and material injury. Additional supporting information is located at: https://cwcb.colorado.gov/2026-isf-recommendations.

RECOMMENDED ISF REACH

CPW recommended that the CWCB appropriate an ISF water right on a reach of Hauskins Creek at the ISF Workshop in January, 2017. Hauskins Creek is located within Garfield County and is approximately 32 miles east of the Town of Meeker (See Vicinity Map). The stream originates near Lost Lake Peak and flows southwesterly until it reaches the confluence with the North Fork White River. Hauskins Creek is a tributary to the North Fork White River which is a tributary to the White River.

The proposed ISF reach extends from the headwaters downstream to the confluence with the North Fork White River for a total of 2.11 miles. Around 76% of the proposed

reach is on the White River National Forest and most of the basin is part of the Flat Tops Wilderness Area, with the lower terminus of the proposed reach on the Rio Blanco Ranch (See Land Ownership Map). CPW is recommending an ISF protection on this stream to preserve the natural environment and to fulfill CPW's statutory charge that fish and wildlife resources and their environment should be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors. Securing an ISF water right on this reach will assist in protecting the fishery and conserving fish habitat in alignment with CPW's statutory directive and strategic planning documents. Specifically, this stream supports native Colorado River cutthroat trout (CRCT), a Species of Greatest Conservation Need, per CPW's State Wildlife Action Plan (CPW, 2015; SWAP). CPW is committed to taking actions to preserve and protect conservation populations of these species and watershed and stream conditions they rely on.

OUTREACH

Stakeholder input is a valued part of the CWCB staff's analysis of ISF recommendations. Currently, more than 1,100 people subscribe to the ISF mailing list. Notice of the potential appropriation of an ISF water right on Hauskins Creek was sent to the mailing list in November 2025, March 2025, March 2024, March 2023, March 2022, March 2021, March 2020, November 2019, and March 2019. As this reach is largely within the White River National Forest boundary, the Unites States Forest Service was notified of this recommendation on August 25, 2025. A public notice about this recommendation was also published in the Rifle Citizens Telegram on December 16, 2025

Staff presented information about the ISF program and this recommendation to the Garfield County Board of County Commissioners on November 10, 2025. In addition, staff spoke with Betty Kract, District 43 Lead Water Commissioner, on October 7, 2025 regarding water availability on Hauskins Creek. Ms. Kract confirmed CWCB staff's understanding of water administration in the Hauskins Creek catchment area. Finally,

staff was in consistent communication with Josh Halstead, the General Manager of Rio Blanco Ranch, to better understand water use practices. Hauskins Creek terminates on Rio Blanco Ranch and Mr. Halstead is supportive of the protection this recommendation might offer the fisheries that Rio Blanco Ranch utilizes.

NATURAL ENVIRONMENT

CWCB staff relies on the recommending entity to provide information about the natural environment. In addition, staff reviews information and conducts site visits for each recommended ISF appropriation. This information provides the Board with a basis for determining that a natural environment exists.

The Hauskins Creek watershed has forested land cover containing stands of aspen, lodgepole pine, spruce, and conifer. Hauskins Creek supports a healthy riparian area with dense plants and mosses. Upland and riparian communities support ample overhead cover and shading of the stream.

Hauskins Creek is a first to second order stream that is moderate to high gradient. The channel type is typical of a headwaters stream with an entrenched V-shaped channel and large substrate that ranges from fine gravels to small boulders. Substrate is predominantly fine gravel and medium-sized cobbles. Large cobble and small boulder features in the channel creates pocket pool habitat for fish. The channel is mainly single thread with some side channel formation. There is some large wood in the creek which supports habitat complexity, shading, and nutrient cycling. Much of the aquatic habitat observed by CPW staff includes high gradient riffles, cascades, and pool features that offer good holding habitat.

Fish sampling conducted by CPW in 2012 indicates the stream supports brook trout and CRCT (Table 1). CRCT are listed as a Tier 1 Species of Greatest Conservation Need in CPW's SWAP.

Table 1. List of species identified in Hauskins Creek.

Species Name	Scientific Name	Status
Colorado River cutthroat trout	*Oncorhynchus clarkii pleuriticus*	State - Species of Greatest Conservation Need State - Species of Special Concern
brook trout	*Salvelinus fontinalis*	None

ISF QUANTIFICATION

CWCB staff relies on the biological expertise of the recommending entity to quantify the amount of water required to preserve the natural environment to a reasonable degree. CWCB staff performs a thorough review of the quantification analyses completed by the recommending entity to ensure consistency with accepted standards.

Quantification Methodology

CPW staff used the R2Cross method to develop the initial ISF recommendation. The R2Cross method is based on a hydraulic model and uses field data collected in a stream riffle (CWCB, 2022; CWCB, 2024). Riffles are the stream habitat type that are most vulnerable to dry if streamflow ceases. The data collected consists of a streamflow measurement, a survey of channel geometry and features at a cross section, and a survey of the longitudinal slope of the water surface.

The R2Cross model uses Ferguson's Variable-Power Equation (VPE) to estimate roughness and hydraulic conditions at different water stages at the measured cross section (Ferguson, 2007; Ferguson, 2021). This approach is based on calibrating the model as described in Ferguson (2021). The model is used to evaluate three hydraulic criteria: average depth, average velocity, and percent wetted perimeter. Maintaining these hydraulic parameters at adequate levels across riffle habitat types also will maintain aquatic habitat in pools and runs for most life stages of fish and aquatic macroinvertebrates (Nehring, 1979). CPW staff use the model results to develop an

initial recommendation for summer and winter flows. The summer flow recommendation is based on the flow that meets all three hydraulic criteria. The winter flow recommendation is based on the flow that meets two of the three hydraulic criteria.

The R2Cross method estimates the biological amount of water needed for summer and winter periods. The recommending entity uses the R2Cross results and its biological expertise to develop an initial ISF recommendation. CWCB staff then evaluates water availability for the reach typically based on median hydrology (see the Water Availability section below for more details). The water availability analysis may indicate less water is available than the initial recommendation. In that case, the recommending entity either modifies the magnitude and/or duration of the recommended ISF rates if the available flows will preserve the natural environment to a reasonable degree or withdraws the recommendation.

Data Collection and Analysis

CPW collected R2Cross data at two transects for this proposed ISF reach (Table 2 and Site Map). Results obtained at more than one cross section are averaged to determine the R2Cross flow rate for the stream reach. The R2Cross model results in a winter flow of 0.66 cfs and a summer flow of 3.09 cfs. R2Cross field data and model results can be found in the appendix to this report.

Table 2. Summary of R2Cross cross-section measurements and results for Hauskins Creek.

Date, XS #	Top Width (feet)	Streamflow (cfs)	Winter Rate (cfs)	Summer Rate (cfs)
07/01/2017, 1	11.75	0.34	0.97	3.30
07/11/2018, 2	8.00	0.52	0.35	2.87
		Average	**0.66**	**3.09**

ISF Recommendation

CPW recommends the following flows based on R2Cross modeling analyses, biological expertise, and staff's water availability analysis.

0.65 cfs is recommended from August 1 through May 20. This flow rate meets two of three hydraulic criteria. This baseflow rate initiates in late summer and is extended through spring runoff in response to water availability constraints. This flow rate will support sufficient wetted perimeter and depth in riffles and will provide areas of holding habitat necessary to overwinter fish.

2.9 cfs is recommended from May 21 through June 30. This flow rate is reduced due to water availability limitations. This flow rate will support adequate depth and wetted perimeter in all cross sections and almost maintains adequate velocities in all cross sections. Maintaining these hydraulic criteria at riffles will also support habitat availability in pools, glides, and runs. Increased habitat availability is beneficial to fish during late spring and summer when they are active feeding and moving longitudinally throughout the channel.

0.50 cfs is recommended from July 1 through July 31; this flow rate is reduced due to water availability limitations though will provide adequate depth for fish passage in late summer. Wetted perimeter will also be maintained in some riffle cross sections and there will be adequate habitat availability in deep habitat features like pools and glides.

WATER AVAILABILITY

CWCB staff conducts hydrologic analyses for each recommended ISF appropriation to provide the Board with a basis for determining that water is available.

Water Availability Methodology

Each recommended ISF reach has a unique flow regime that depends on variables such as the timing, magnitude, and location of water inputs (such as rain, snow, and snowmelt) and water losses (such as diversions, reservoirs, evaporation and transpiration, groundwater recharge, etc.). This approach focuses on streamflow and the influence of flow alterations, such as diversions, to understand how much water is physically available in the recommended reach.

Staff's hydrologic analysis is data-driven, meaning that staff gathers and evaluates the best available data and uses the best available analysis method for that data. When available, long-term stream gage data (period of record 20 or more years) are used to evaluate streamflow. Other streamflow information such as short-term gages, temporary gages, spot streamflow measurements, diversion records, and regression-based models are used when long-term gage data is not available or is not representative of the recommended reach. CSUFlow18 is a multiple regression model developed by Colorado State University researchers using streamflow gage data collected between 2001 and 2018 (Eurich et al., 2021). This model estimates mean-monthly streamflow based on drainage basin area, basin terrain variables, and average basin precipitation and snow persistence. Diversion records are used to evaluate the effect of surface water diversions when necessary. Interviews with water commissioners, landowners, and ditch or reservoir operators can provide additional information. A range of analytical techniques may be employed to extend gage records, estimate streamflow in ungaged locations, and estimate the effects of diversions. The goal is to obtain the most detailed and reliable estimate of hydrology using the most efficient analysis technique.

The final product of the hydrologic analysis used to determine water availability is a hydrograph, which shows streamflow and the proposed ISF rate over the course of one year. The hydrograph will show median daily values when daily data is available from gage records; otherwise, it will present mean-monthly streamflow values. Staff will

calculate 95% confidence intervals for the median streamflow if there is sufficient data. Statistically, there is 95% confidence that the true value of the median streamflow is located within the confidence interval.

Basin Characteristics

The contributing basin of the proposed ISF on Hauskins Creek is 1.3 square miles, with an average elevation of 10,061 feet and average annual precipitation of 33.8 inches. Hydrology is largely natural and snowmelt driven with stable baseflows following spring runoff. In the reach there is very limited anthropogenic change to streamflow and the basin has natural hydrology.

Water Rights Assessment

Staff evaluated the existing absolute water rights in the basin tributary to the ISF reach that could affect streamflow in the proposed reach. There are no exchanges within the proposed reach and there is no transbasin water leaving or entering this system. There is only one diversion structure near the lower terminus, the Lynx Creek Ditch. This ditch has two water rights: 2.26 cfs with an appropriation date of 5/1/1901 and 2.39 cfs with an appropriation date of 6/1/1901, WDID 4300824. The Lynx Creek Ditch is physically located on Hauskins Creek and not Lynx Creek, one stream to the east. The diversion location was confirmed by reviewing the original water court application location map (See Attachments) and by conferring with Water Commissioner Betty Kract (10/8/2025). Division of Water Resources (DWR) comments in Colorado Decision Support System (CDSS), indicates that Lynx Creek Ditch diverts from both Hauskins Creek and Picket Pin Creek, one stream to the west. Picket Pin Creek is formally named Hines Creek in the originally water court application. DWR comments indicate that the senior Lynx Creek Ditch water right diverts 1.94 cfs of water from Hauskins Creek and 0.32 cfs from Picket Pin Creek; the junior right can divert from either of these streams.

The total diversions from Hauskins Creek were estimated based on the available information. The Lynx Creek Ditch diversions were partitioned between Hauskins Creek and Picket Pin Creek. The total diversions from Hauskins Creek were calculated as the first 1.94 cfs diverted under the senior right and 50% of the total diversions exceeding 2.26 cfs.

Data Collection and Analysis

Representative Gage Analysis

There is not a current or historic streamflow gage on Hauskins Creek. The closest gage identified was the historic North Fork White River above Ripple Creek near Trappers Lake, CO gage (USGS 093202420). The gage was located approximately 2.1 miles downstream from the confluence with Hauskins Creek. This gage had a continuous period of record from 10/01/1965 to 9/29/1973. The drainage basin of the North Fork White River gage was 62 square miles, with an average elevation of 10,373 feet and average annual precipitation of 39 inches. A number of water uses upstream from the gage alter hydrology from natural conditions. The basin tributary to the North Fork White River gage includes 53 cfs in surface water diversions (35 cfs is a non-consumptive hydropower diversion), 0.2 cfs in wells, and 438 acre-feet of storage. This summary included the water rights described above on the proposed reach.

The North Fork White River gage record was compared to nearby climate stations to evaluate how the historical record compares to a recent 30 year-record. The closest climate stations with data that included the gage years and the most recent 30 years were both located approximately 33 miles to the west, in Meeker CO (USC00055487, MEEKER NO 2 and USC00055484, MEEKER 3 W). Neither climate station recorded data during the entire North Fork White River gage record. MEEKER 3 W daily precipitation data from 1/1/1965 through 9/30/1970 and MEEKER NO 2 daily precipitation data from 10/1/1970 through 12/31/1984 were combined to evaluate the full period of record for the North Fork White River gage. Staff assumes that these two climate stations, in close proximity, provide similar information. MEEKER 3 W daily

precipitation data from 1/1/1995 through 12/31/2024 was used to evaluate recent precipitation conditions.

When compared to the last 30 years, the Nork Fork White River Gage record (1965-1973) had five years with below average annual precipitation and four years with above average annual precipitation. During the POR, 1971 was below the 25th percentile for annual precipitation and 1969 was above the 90th percentile annual precipitation. Therefore, when compared to current conditions, the available gage data includes a wide range of climate conditions.

The North Fork White River gage was used to calculate the median daily streamflow which was prorated by 0.02 based on a weighted-area precipitation method to estimate streamflow at the lower terminus of Hauskins Creek. The median diversions from the Lynx Creek Ditch, as apportioned to Hauskins Creek, described above, were then subtracted to estimate streamflow in the proposed reach. This analysis shows that water is available for the flow rates requested.

Site Visit Data

CWCB staff observed Hauskins Creek in 2018 but did not make any flow measurements.

Water Availability Summary

The hydrograph shows the estimated median daily streamflow for the proposed reach, the diversion adjusted median, and the proposed ISF rate (See Complete Hydrograph). The proposed ISF flow rate is below the diversion adjusted median daily streamflow. Staff conclude that water is available for appropriation on Hauskins Creek.

MATERIAL INJURY

If decreed, the proposed ISF on Hauskins Creek would be a new junior water right. This ISF water right can exist without material injury to other senior water rights. Under the provisions of section 37-92-102(3)(b), C.R.S., the CWCB will recognize any

uses or exchanges of water in existence on the date this ISF water right is appropriated.

ADDITIONAL INFORMATION

Common Acronyms and Abbreviations

Term	Definition
ac-ft	acre feet
BLM	Bureau of Land Management
cfs	cubic feet per second
CWCB	Colorado Water Conservation Board
CPW	Colorado Parks and Wildlife
CRCT	Colorado River cutthroat trout
DWR	Division of Water Resources
HCCA	High Country Conservation Advocates
ISF	Instream Flow
NLL	Natural Lake Level
SWAP	State Wildlife Action Plan
USGS	United States Geological Survey
USFS	United States Forest Service
XS	Cross section

Citations

Colorado Parks and Wildlife, 2015. State Wildlife Action Plan: A strategy for conserving wildlife in Colorado. https://cpw.widencollective.com/assets/share/asset/nbenjdfemj

Colorado Water Conservation Board, 2024, R2Cross field manual. https://dnrweblink.state.co.us/cwcbsearch/0/edoc/224685/R2Cross%20Field%20Manual%202024.pdf

Colorado Water Conservation Board, 2022, R2Cross model- User's manual and technical guide. https://r2cross.erams.com/

Eurich, A., Kampf, S.K., Hammond, J.C., Ross, M., Willi, K., Vorster, A.G. and Pulver, B., 2021, Predicting mean annual and mean monthly streamflow in Colorado ungauged basins, River Research and Applications, 37(4), 569-578.

Ferguson, R.I., 2007. Flow resistance equations for gravel- and boulder-bed streams. Water Resources Research 43. https://doi.org/10.1029/2006WR005422

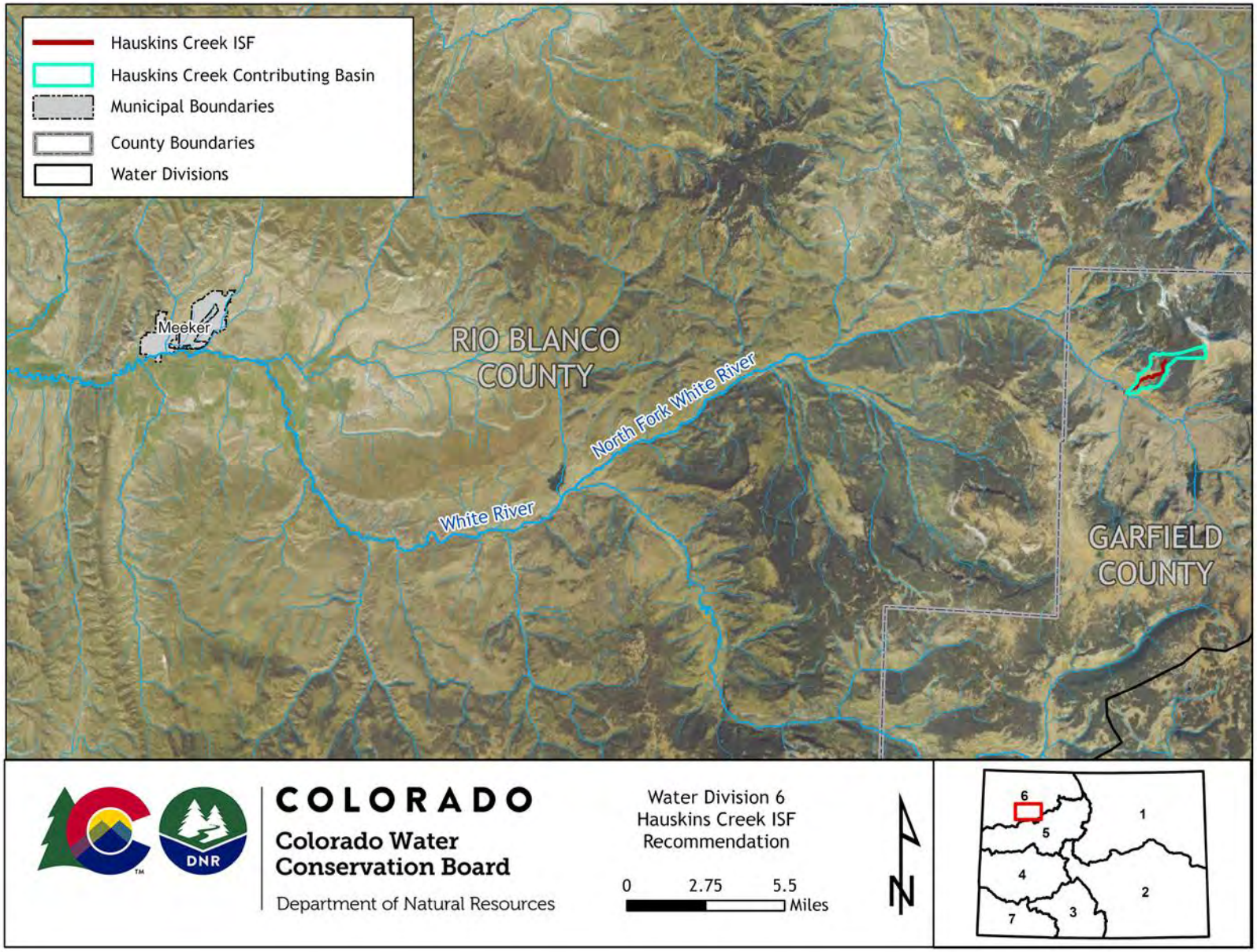
Ferguson, R.I., 2021. Roughness calibration to improve flow predictions in coarse-bed streams. Water Res 57. https://doi.org/10.1029/2021WR029979

Nehring, B.R., 1979, Evaluation of instream flow methods and determination of water quantity needs for streams in the state of Colorado, Colorado Division of Wildlife.

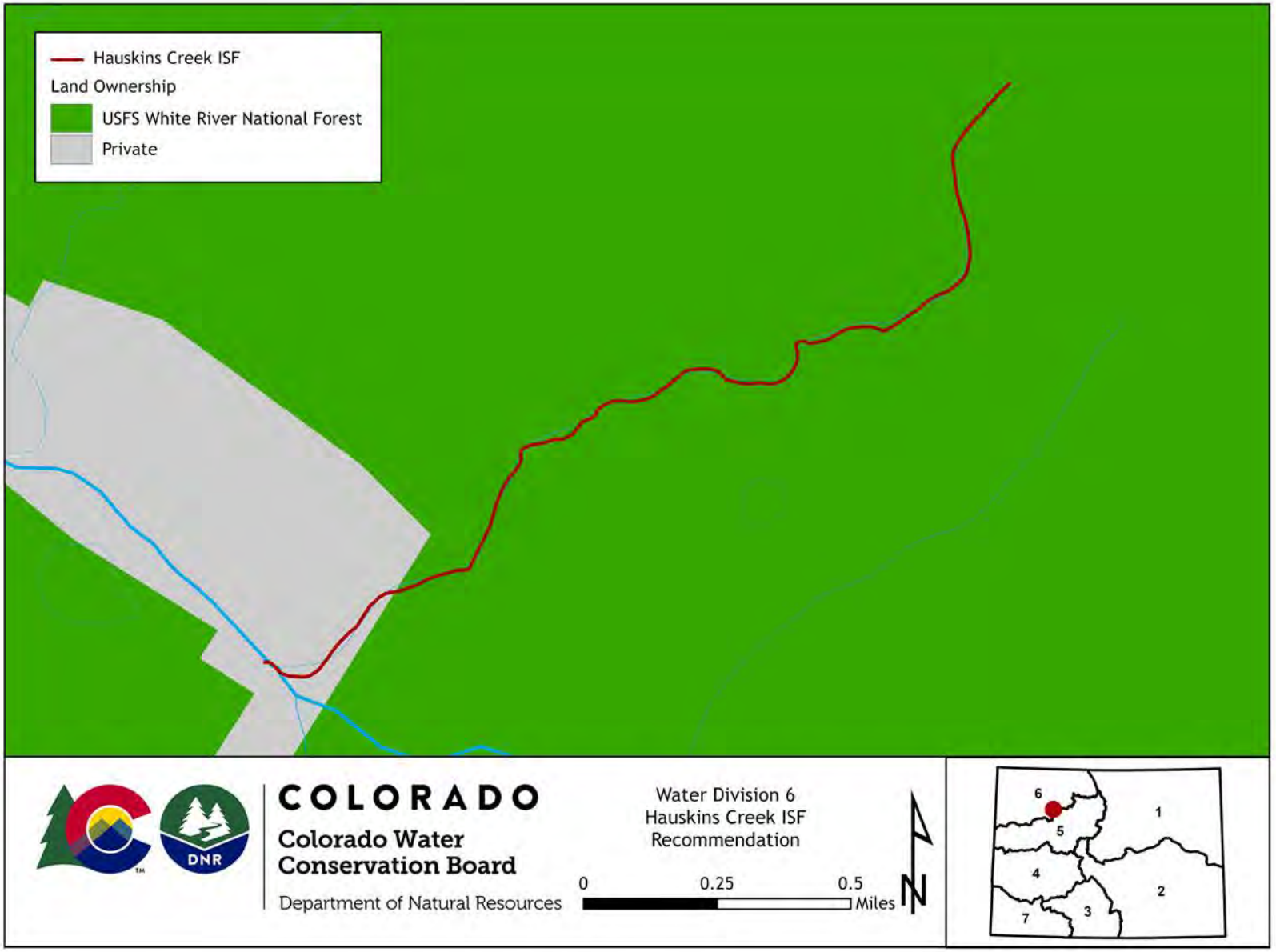
Metadata Descriptions

The UTM locations for the upstream and downstream termini were derived from CWCB GIS using the National Hydrography Dataset (NHD). Projected Coordinate System: NAD 1983 UTM Zone 13N.

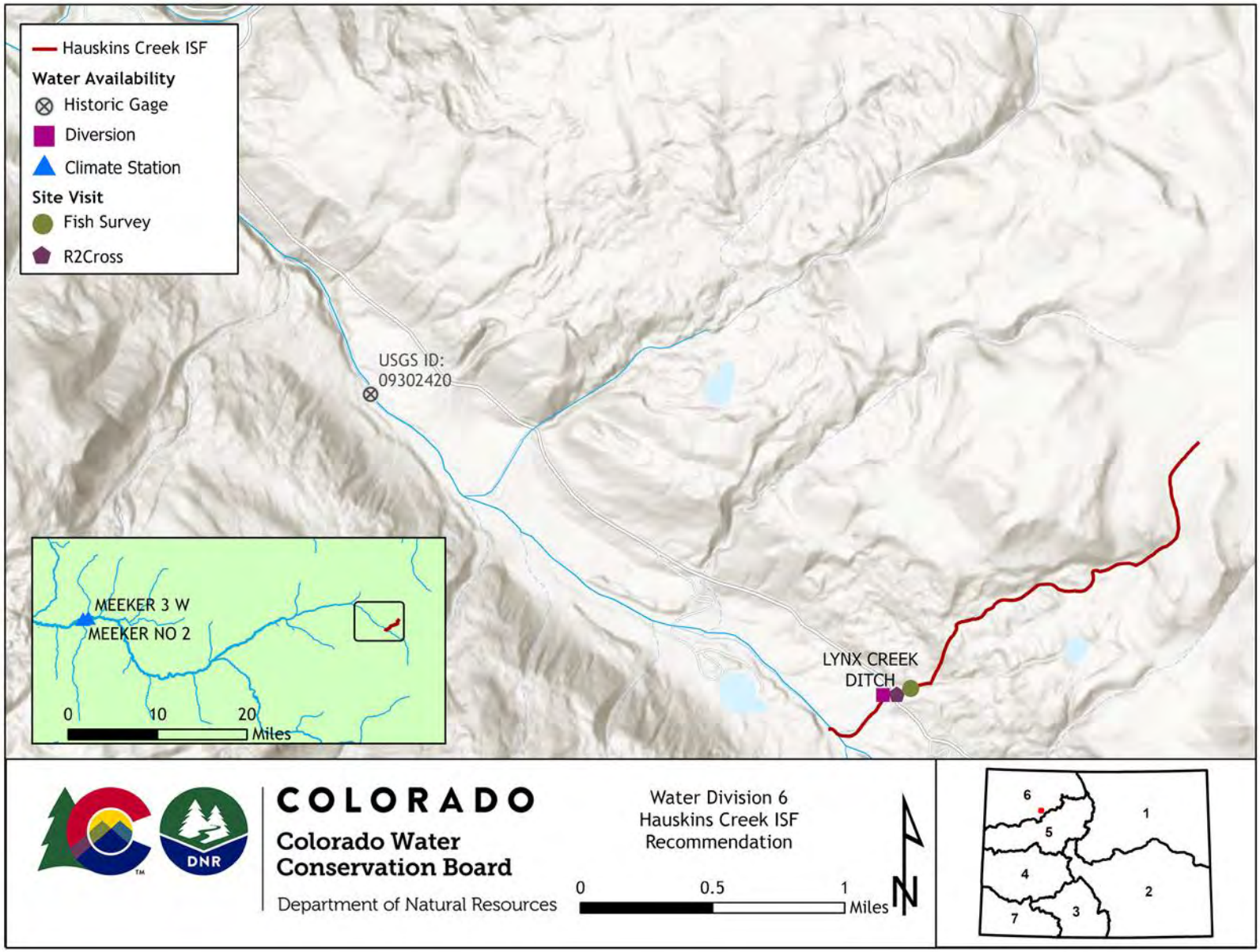
VICINITY MAP



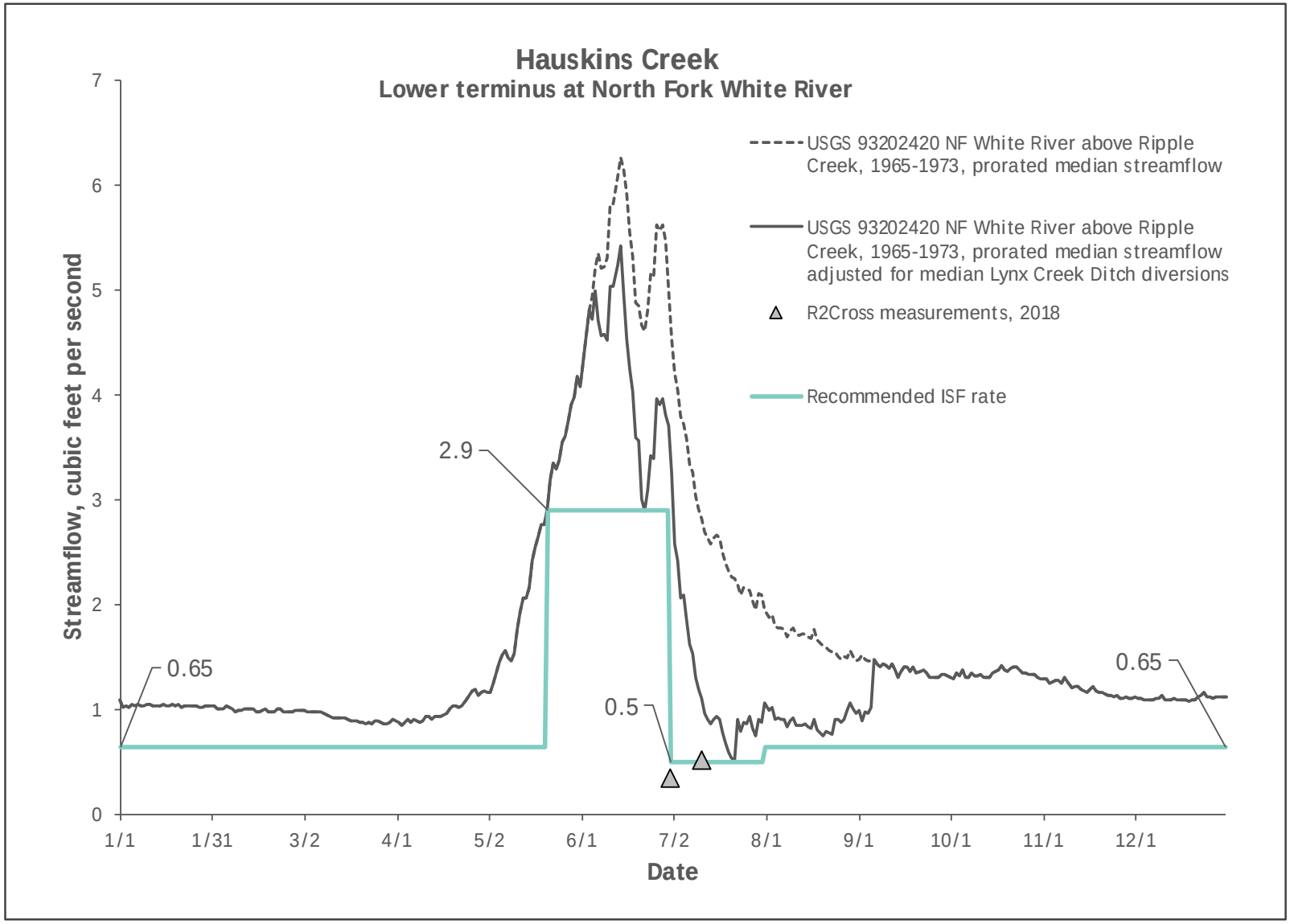
LAND OWNERSHIP MAP



SITE MAP


Hauskins Creek ISF
Water Availability
Historic Gage
Diversion
Climate Station
Site Visit
Fish Survey
R2Cross
USGS ID:
09302420
MEEKER 3 W
MEEKER NO 2
0
10
20
Miles
LYNX CREEK
DITCH
COLORADO
Colorado Water
Conservation Board
Department of Natural Resources
Water Division 6
Hauskins Creek ISF
Recommendation
0
0.5
1
Miles
N
6
1
5
4
2
7
3

COMPLETE HYDROGRAPH



Lynx Creek Executive Summary

CWCB STAFF INSTREAM FLOW RECOMMENDATION
January 26-27, 2026

UPPER TERMINUS:	headwaters in the vicinity of UTM North: 4434446.39 UTM East: 308389.91
LOWER TERMINUS:	confluence North Fork White River at UTM North: 4433035.35 UTM East: 306570.91
WATER DIVISION/DISTRICT:	6/43
COUNTY:	Garfield
WATERSHED:	Upper White
CWCB ID:	18/6/A-014
RECOMMENDER:	Colorado Parks and Wildlife (CPW)
LENGTH:	1.58 miles
FLOW RECOMMENDATION:	0.8 cfs (1/01 - 05/14) 1.5 cfs (05/15 - 08/14) 1.2 cfs (08/15 – 09/30) 0.9 cfs (10/01 – 12/31)

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

BACKGROUND

Colorado's General Assembly created the Instream Flow and Natural Lake Level Program in 1973, recognizing "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3), C.R.S.). The statute vests the Colorado Water Conservation Board (CWCB or Board) with the exclusive authority to appropriate and acquire instream flow (ISF) and natural lake level (NLL) water rights. Before initiating a water right filing, the Board must determine that: 1) there is a natural environment that can be preserved to a reasonable degree with the Board's water right if granted, 2) the natural environment will be preserved to a reasonable degree by the water available for the appropriation to be made, and 3) such environment can exist without material injury to water rights.

The information contained in this Executive Summary and the associated supporting data and analyses form the basis for staff's ISF recommendation to be considered by the Board. This Executive Summary provides sufficient information to support the CWCB findings required by ISF Rule 5i on natural environment, water availability, and material injury. Additional supporting information is located at: https://cwcb.colorado.gov/2026-isf-recommendations.

RECOMMENDED ISF REACH

CPW recommended that the CWCB appropriate an ISF water right on a reach of Lynx Creek at the ISF Workshop in January 2017. Lynx Creek is located within Garfield County and is approximately 34 miles east of the Town of Meeker (See Vicinity Map). The stream originates near Lost Lake Peak and flows southwesterly until it reaches the confluence with the North Fork White River. Lynx Creek is a tributary to the North Fork White River which is a tributary to the White River.

The proposed ISF reach extends from the headwaters downstream to the confluence with the North Fork White River for a total of 1.58 miles. The entire proposed stream

length is on the White River National Forest and most of the basin is part of the Flat Tops Wilderness Area (See Land Ownership Map). CPW is recommending an ISF protection on this stream to preserve the natural environment and to fulfill CPW's statutory charge that fish and wildlife resources and their environment should be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors. Securing an ISF water right on this reach will assist in protecting the fishery and conserving fish habitat in alignment with CPW's statutory directive and strategic planning documents. Specifically, this stream supports native Colorado River cutthroat trout (CRCT), a Species of Greatest Conservation Need, per CPW's State Wildlife Action Plan (CPW, 2015; SWAP). CPW is committed to taking actions to preserve and protect conservation populations of these species and watershed and stream conditions they rely on.

OUTREACH

Stakeholder input is a valued part of the CWCB staff's analysis of ISF recommendations. Currently, more than 1,100 people subscribe to the ISF mailing list. Notice of the potential appropriation of an ISF water right on Lynx Creek was sent to the mailing list in November 2025, March 2025, March 2024, March 2023, March 2022, March 2021, March 2020, November 2019, and March 2019. As this reach is entirely on public land, the Unites States Forest Service was notified of this recommendation on August 25, 2025. A public notice about this recommendation was also published in the Rifle Citizens Telegram on December 16, 2025.

Staff presented information about the ISF program and this recommendation to the Garfield County Board of County Commissioners on November 10, 2025. In addition, staff spoke with Betty Kract, District 43 Lead Water Commissioner, on October 7, 2025 regarding water availability on Lynx Creek. Ms. Kract confirmed CWCB staff's understanding of current water administration in the Lynx Creek catchment area. Finally, as Lynx Creek drains into the White River directly above Rio Blanco Ranch, staff was in consistent communication with Josh Halstead, the General Manager of Rio

Blanco Ranch, to maintain stakeholder engagement. Mr. Halstead is supportive of the protection this recommendation might offer the fisheries that Rio Blanco Ranch utilizes.

NATURAL ENVIRONMENT

CWCB staff relies on the recommending entity to provide information about the natural environment. In addition, staff reviews information and conducts site visits for each recommended ISF appropriation. This information provides the Board with a basis for determining that a natural environment exists.

The Lynx Creek headwaters originate at over 10,200 feet in the Flat Tops Wilderness. The watershed has forested land cover containing stands of aspen, lodgepole pine, spruce, and conifer. Lynx Creek supports a healthy riparian area with robust plants and mosses, including watercress and nettle. Upland and riparian communities support plenty of overhead cover and shading of the stream.

Lynx Creek is a first to second order stream that is moderate to high gradient. The channel type is typical of a headwaters stream with an entrenched V-shaped channel and substrate that is predominantly coarse to small cobble. Large cobble and small boulder features creates pocket pool habitat for fish. The channel over the observed reach is mainly single thread. There is considerable wood in the creek which supports habitat complexity, shading, and nutrient cycling. Much of the aquatic habitat observed by CPW staff includes high gradient riffles, cascades, and pool features that offer good holding habitat.

Fish sampling conducted by CPW in 2012 indicates the stream supports Colorado River Cutthroat Trout (CRCT; Table 1). CRCT are listed in CPW's SWAP as a Tier 1 Species of Greatest Conservation Need. Macroinvertebrates were noted in the field to include caddisfly larvae.

Table 1. List of species identified in Lynx Creek.

Species Name	Scientific Name	Status
Colorado River cutthroat trout	*Oncorhynchus clarkii pleuriticus*	State - Species of Greatest Conservation Need State - Species of Special Concern

ISF QUANTIFICATION

CWCB staff relies on the biological expertise of the recommending entity to quantify the amount of water required to preserve the natural environment to a reasonable degree. CWCB staff performs a thorough review of the quantification analyses completed by the recommending entity to ensure consistency with accepted standards.

Quantification Methodology

CPW staff used the R2Cross method to develop the initial ISF recommendation. The R2Cross method is based on a hydraulic model and uses field data collected in a stream riffle (CWCB, 2022; CWCB, 2024). Riffles are the stream habitat type that are most vulnerable to dry if streamflow ceases. The data collected consists of a streamflow measurement, a survey of channel geometry and features at a cross-section, and a survey of the longitudinal slope of the water surface.

The R2Cross model uses Ferguson's Variable-Power Equation (VPE) to estimate roughness and hydraulic conditions at different water stages at the measured cross-section (Ferguson, 2007; Ferguson, 2021). This approach is based on calibrating the model as described in Ferguson (2021). The model is used to evaluate three hydraulic criteria: average depth, average velocity, and percent wetted perimeter. Maintaining these hydraulic parameters at adequate levels across riffle habitat types also will maintain aquatic habitat in pools and runs for most life stages of fish and aquatic macroinvertebrates (Nehring, 1979). CPW staff use the model results to develop an initial recommendation for summer and winter flows. The summer flow recommendation is based on the flow that meets all three hydraulic criteria. The

winter flow recommendation is based on the flow that meets two of the three hydraulic criteria.

The R2Cross method estimates the biological amount of water needed for summer and winter periods. The recommending entity uses the R2Cross results and its biological expertise to develop an initial ISF recommendation. CWCB staff then evaluates water availability for the reach typically based on median hydrology (see the Water Availability section below for more details). The water availability analysis may indicate less water is available than the initial recommendation. In that case, the recommending entity either modifies the magnitude and/or duration of the recommended ISF rates if the available flows will preserve the natural environment to a reasonable degree or withdraws the recommendation.

Data Collection and Analysis

CPW collected R2Cross data at two transects for this proposed ISF reach (Table 2 and Site Map). Results obtained at more than one cross-section are averaged to determine the R2Cross flow rate for the stream reach. The R2Cross model results in a winter flow of 0.92 cfs and a summer flow of 1.48 cfs. R2Cross field data and model results can be found in the appendix to this report.

Table 2. Summary of R2Cross cross-section measurements and results for Lynx Creek.

Date, XS #	Top Width (feet)	Streamflow (cfs)	Winter Rate (cfs)	Summer Rate (cfs)
07/11/2017, 2	7.00	1.15	0.59	0.92
08/19/2019, 3	12.47	2.25	1.25	2.03
		Average	**0.92**	**1.48**

ISF Recommendation

CPW recommends the following flows based on R2Cross modeling analyses, biological expertise, and staff's water availability analysis.

0.80 cfs is recommended from January 1 through May 14; this flow rate is reduced due to water availability considerations. This flow rate supports overwintering habitat for fish.

1.5 cfs is recommended from May 15 through August 14. This flow rate meets all three hydraulic criteria. This flow rate will support excellent habitat availability in riffles, pools, glides, and runs. Ample habitat availability is beneficial to fish during the spring and early summer when they are active feeding and spawning and need to move longitudinally throughout the channel to complete their life cycle requirements.

1.2 cfs is recommended from August 15 through September 30; this flow rate is reduced due to water availability considerations. This flow rate supports habitat availability will also be maintained in pools, glides, and runs. This is an important time period for fish as long days and warm water temperatures facilitate.

0.9 cfs is recommended from October 1 through December 31. This flow rate meets two of three hydraulic criteria. This flow rate allows fish to move longitudinally through the stream to find holding habitats that serve as overwintering habitat.

WATER AVAILABILITY

CWCB staff conducts hydrologic analyses for each recommended ISF appropriation to provide the Board with a basis for determining that water is available.

Water Availability Methodology

Each recommended ISF reach has a unique flow regime that depends on variables such as the timing, magnitude, and location of water inputs (such as rain, snow, and snowmelt) and water losses (such as diversions, reservoirs, evaporation and transpiration, groundwater recharge, etc.). This approach focuses on streamflow and

the influence of flow alterations, such as diversions, to understand how much water is physically available in the recommended reach.

Staff's hydrologic analysis is data-driven, meaning that staff gathers and evaluates the best available data and uses the best available analysis method for that data. When available, long-term stream gage data (period of record 20 or more years) are used to evaluate streamflow. Other streamflow information such as short-term gages, temporary gages, spot streamflow measurements, diversion records, and regression-based models are used when long-term gage data is not available or is not representative of the recommended reach. CSUFlow18 is a multiple regression model developed by Colorado State University researchers using streamflow gage data collected between 2001 and 2018 (Eurich et al., 2021). This model estimates mean-monthly streamflow based on drainage basin area, basin terrain variables, and average basin precipitation and snow persistence. Diversion records are used to evaluate the effect of surface water diversions when necessary. Interviews with water commissioners, landowners, and ditch or reservoir operators can provide additional information. A range of analytical techniques may be employed to extend gage records, estimate streamflow in ungaged locations, and estimate the effects of diversions. The goal is to obtain the most detailed and reliable estimate of hydrology using the most efficient analysis technique.

The final product of the hydrologic analysis used to determine water availability is a hydrograph, which shows streamflow and the proposed ISF rate over the course of one year. The hydrograph will show median daily values when daily data is available from gage records; otherwise, it will present mean-monthly streamflow values. Staff will calculate 95% confidence intervals for the median streamflow if there is sufficient data. Statistically, there is 95% confidence that the true value of the median streamflow is located within the confidence interval.

Basin Characteristics

The contributing basin of the proposed ISF on Lynx Creek is 1.2 square miles, with an average elevation of 10,237 feet and average annual precipitation of 37 inches. Hydrology is largely natural and snowmelt driven with stable baseflows following spring runoff. In the reach there is very limited anthropogenic change to streamflow and the basin has natural hydrology.

Water Rights Assessment

Staff evaluated the existing absolute water rights in the basin tributary to the ISF reach that could affect streamflow in the proposed reach. There are no exchanges within the proposed reach and there is no transbasin water leaving or entering this system. There is only one spring decreed in the proposed reach. The decreed spring has two water rights for 0.0010 cfs each, with appropriation dates 10/16/1891 and 12/31/1928 (WDID 4302828). According to the Colorado Decision Support System (CDSS), the Lynx Creek Ditch (WDID 4300780) water source is Lynx Creek. However, the Lynx Creek Ditch is physically located on Hauskins Creek, one stream to the west. This location was confirmed by reviewing the original water court application location map (See Attachments) and by conferring with Water Commissioner Betty Kract (10/8/2025). Therefore, Lynx Creek Ditch does not affect streamflow on Lynx Creek.

Data Collection and Analysis

Representative Gage Analysis

There is not a current or historic streamflow gage on Lynx Creek. The closest gage identified was the historic North Fork White River above Ripple Creek near Trappers Lake, CO gage (USGS 093202420). The gage was located approximately 2.8 miles downstream from the confluence with Lynx Creek. This gage had a continuous period of record from 10/01/1965 to 9/29/1973. The drainage basin of the North Fork White River gage was 62 square miles, with an average elevation of 10,373 feet and average annual precipitation of 39 inches. A number of water uses upstream from the gage alter hydrology from natural conditions. The basin tributary to the North Fork White

River gage includes 53 cfs in surface water diversions (35 cfs is a non-consumptive hydropower diversion), 0.2 cfs in wells, and 438 acre-feet of storage.

The North Fork White River gage record was compared to nearby climate stations to evaluate how the historical record compares to a recent 30 year-record. The closest climate stations with data that included the gage years and the most recent 30 years were both located approximately 33 miles to the west, in Meeker CO (USC00055487, MEEKER NO 2 and USC00055484, MEEKER 3 W). Neither climate station recorded data during the entire North Fork White River gage record. MEEKER 3 W daily precipitation data from 1/1/1965 through 9/30/1970 and MEEKER NO 2 daily precipitation data from 10/1/1970 through 12/31/1984 were combined to evaluate the full period of record for the North Fork White River gage. Staff assumes that these two climate stations, in close proximity, provide similar information. MEEKER 3 W daily precipitation data from 1/1/1995 through 12/31/2024 was used to evaluate recent precipitation conditions.

When compared to the last 30 years, the Nork Fork White River Gage record (1965-1973) had five years with below average annual precipitation and four years with above average annual precipitation. During the POR, 1971 was below the 25th percentile for annual precipitation and 1969 was above the 90th percentile annual precipitation. Therefore, when compared to current conditions, the available gage data includes a wide range of climate conditions.

The North Fork White River gage was used to calculate the median daily streamflow which was prorated by 0.02 based on a weighted-area precipitation method to estimate streamflow at the lower terminus of Lynx Creek. No further adjustments were made to estimate streamflow in the proposed reach. This analysis shows that water is available for the flow rates requested.

Site Visit Data

CWCB staff collaborated with CPW staff in R2Cross fieldwork, no other streamflow measurements were taken on the proposed reach of Lynx Creek

Water Availability Summary

The hydrograph shows the estimated median daily streamflow for the proposed reach and the proposed ISF rate (See Complete Hydrograph). The proposed ISF flow rate is below the median daily streamflow. Staff concludes that water is available for appropriation on Lynx Creek.

MATERIAL INJURY

If decreed, the proposed ISF on Lynx Creek would be a new junior water right. This ISF water right can exist without material injury to other senior water rights. Under the provisions of section 37-92-102(3)(b), C.R.S., the CWCB will recognize any uses or exchanges of water in existence on the date this ISF water right is appropriated.

ADDITIONAL INFORMATION

Common Acronyms and Abbreviations

Term	Definition
ac-ft	acre feet
BLM	Bureau of Land Management
cfs	cubic feet per second
CWCB	Colorado Water Conservation Board
CPW	Colorado Parks and Wildlife
CRCT	Colorado River cutthroat trout
DWR	Division of Water Resources
HCCA	High Country Conservation Advocates
ISF	Instream Flow
NLL	Natural Lake Level
SWAP	State Wildlife Action Plan
USGS	United States Geological Survey
USFS	United States Forest Service
XS	Cross section

Citations

Colorado Parks and Wildlife, 2015, State Wildlife Action Plan: A strategy for conserving wildlife in Colorado. https://cpw.widencollective.com/assets/share/asset/nbenjdfemj

Colorado Water Conservation Board, 2022, R2Cross model- User's manual and technical guide. https://r2cross.erams.com/

Colorado Water Conservation Board, 2024, R2Cross field manual. https://dnrweblink.state.co.us/cwcbsearch/0/edoc/224685/R2Cross%20Field%20Manual%202024.pdf

Eurich, A., Kampf, S.K., Hammond, J.C., Ross, M., Willi, K., Vorster, A.G. and Pulver, B., 2021, Predicting mean annual and mean monthly streamflow in Colorado ungauged basins, River Research and Applications, 37(4), 569-578.

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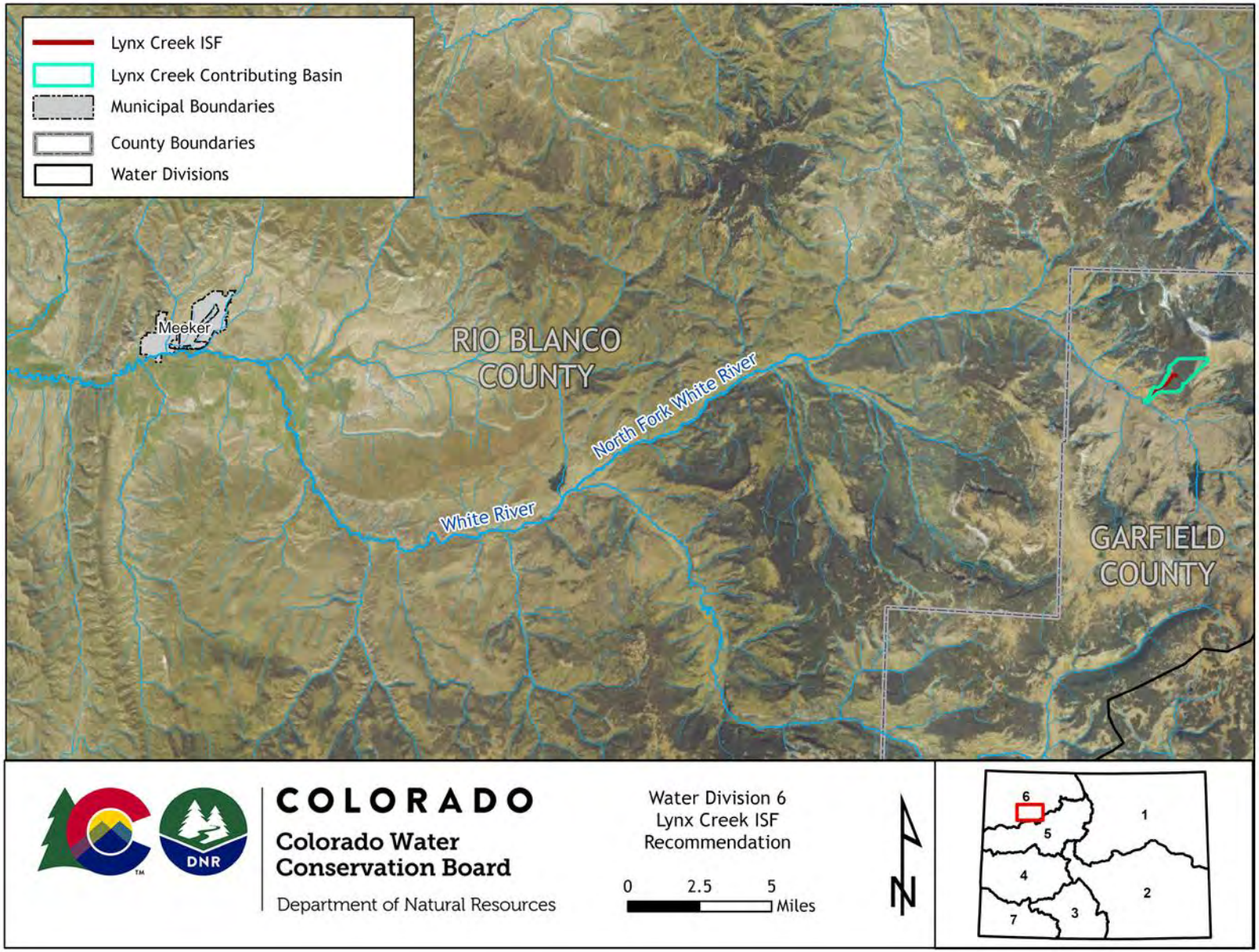
Nehring, B.R., 1979, Evaluation of instream flow methods and determination of water quantity needs for streams in the state of Colorado, Colorado Division of Wildlife.

Metadata Descriptions

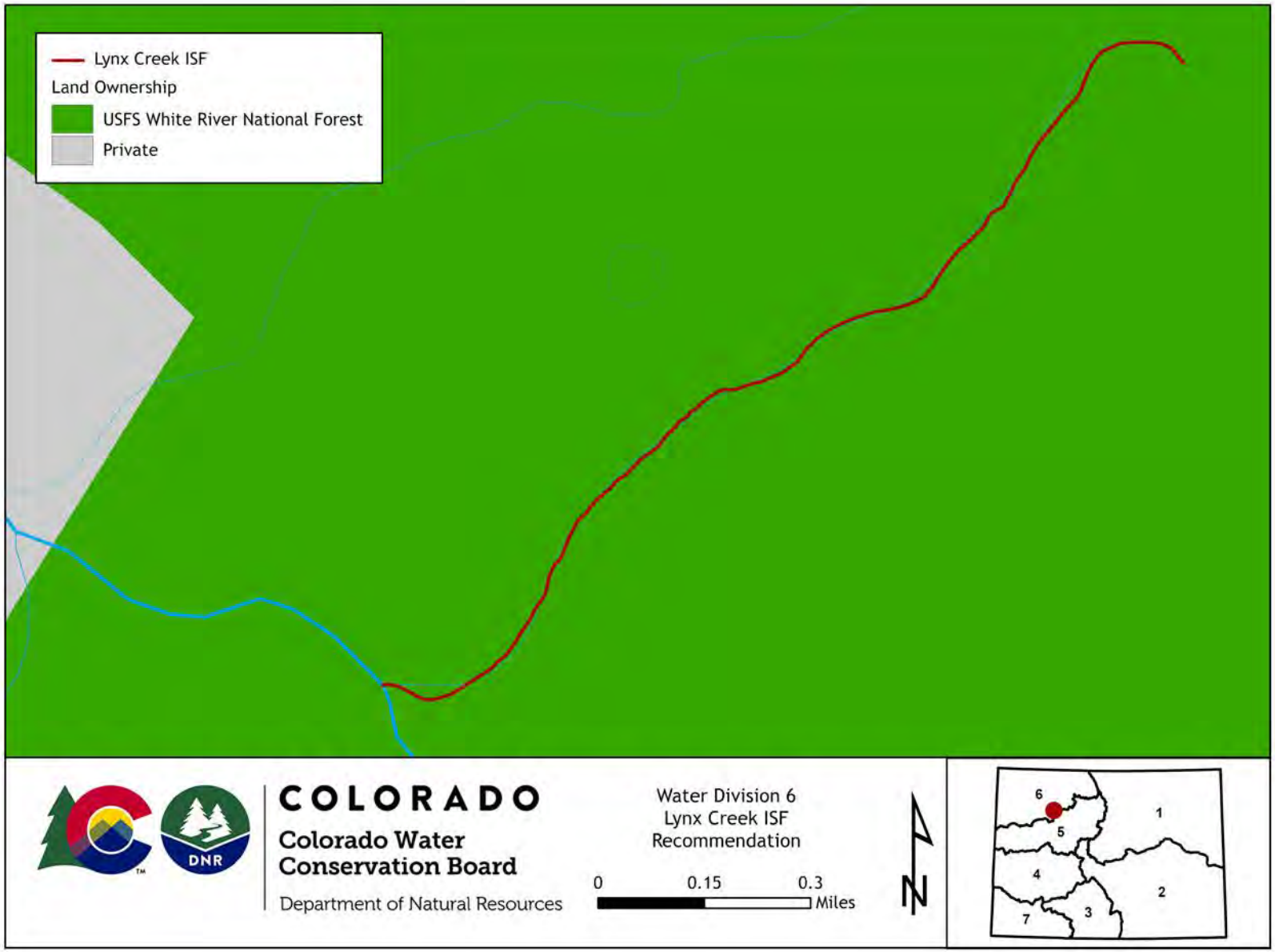
The UTM locations for the upstream and downstream termini were derived from CWCB GIS using the National Hydrography Dataset (NHD).

Projected Coordinate System: NAD 1983 UTM Zone 13N.

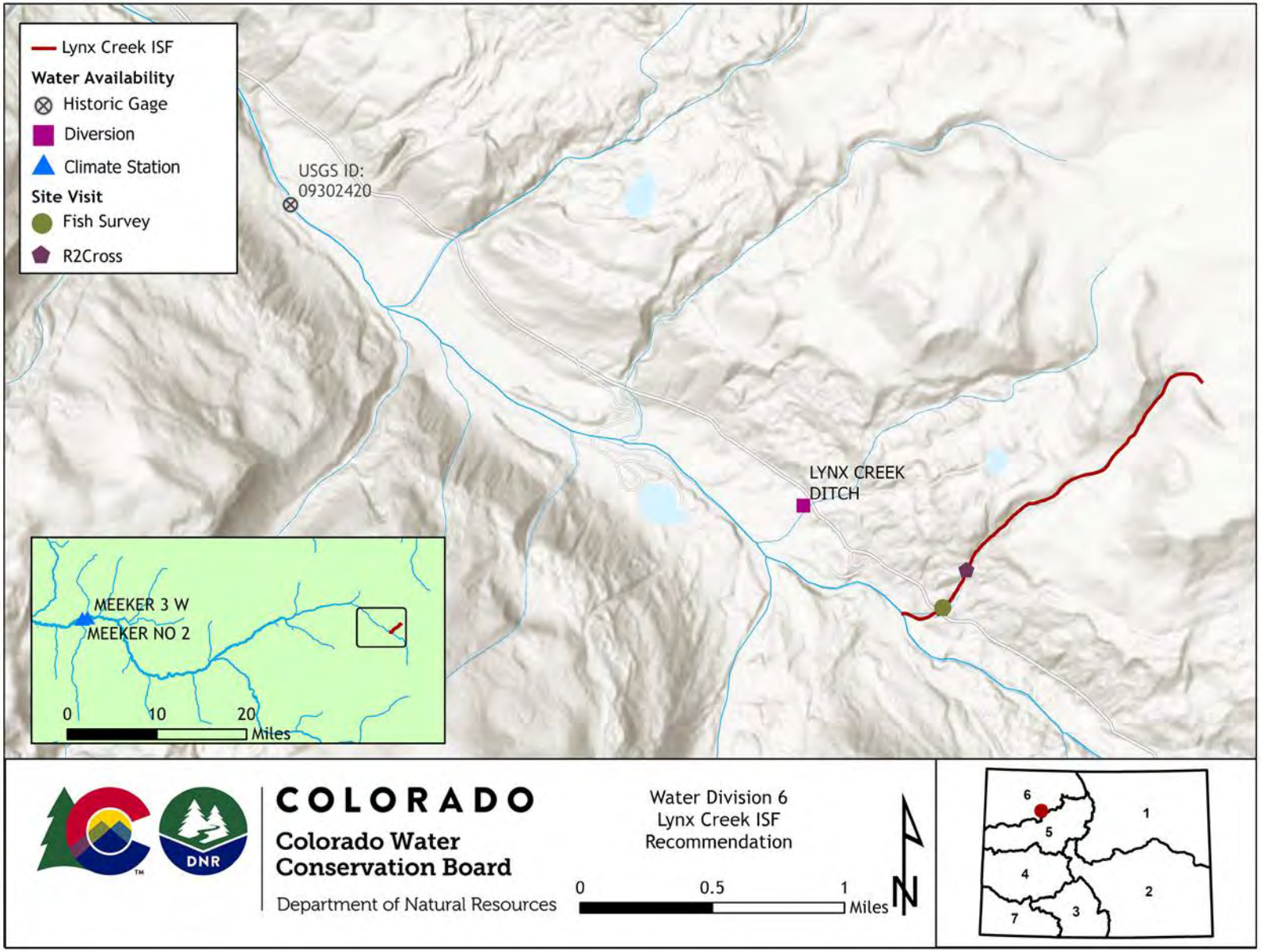
VICINITY MAP



LAND OWNERSHIP MAP



SITE MAP


Lynx Creek ISF
Water Availability
Historic Gage
Diversion
Climate Station
Site Visit
Fish Survey
R2Cross
USGS ID:
09302420
LYNX CREEK
DITCH
MEEKER 3 W
MEEKER NO 2
0
10
20
Miles
COLORADO
Colorado Water
Conservation Board
Department of Natural Resources
Water Division 6
Lynx Creek ISF
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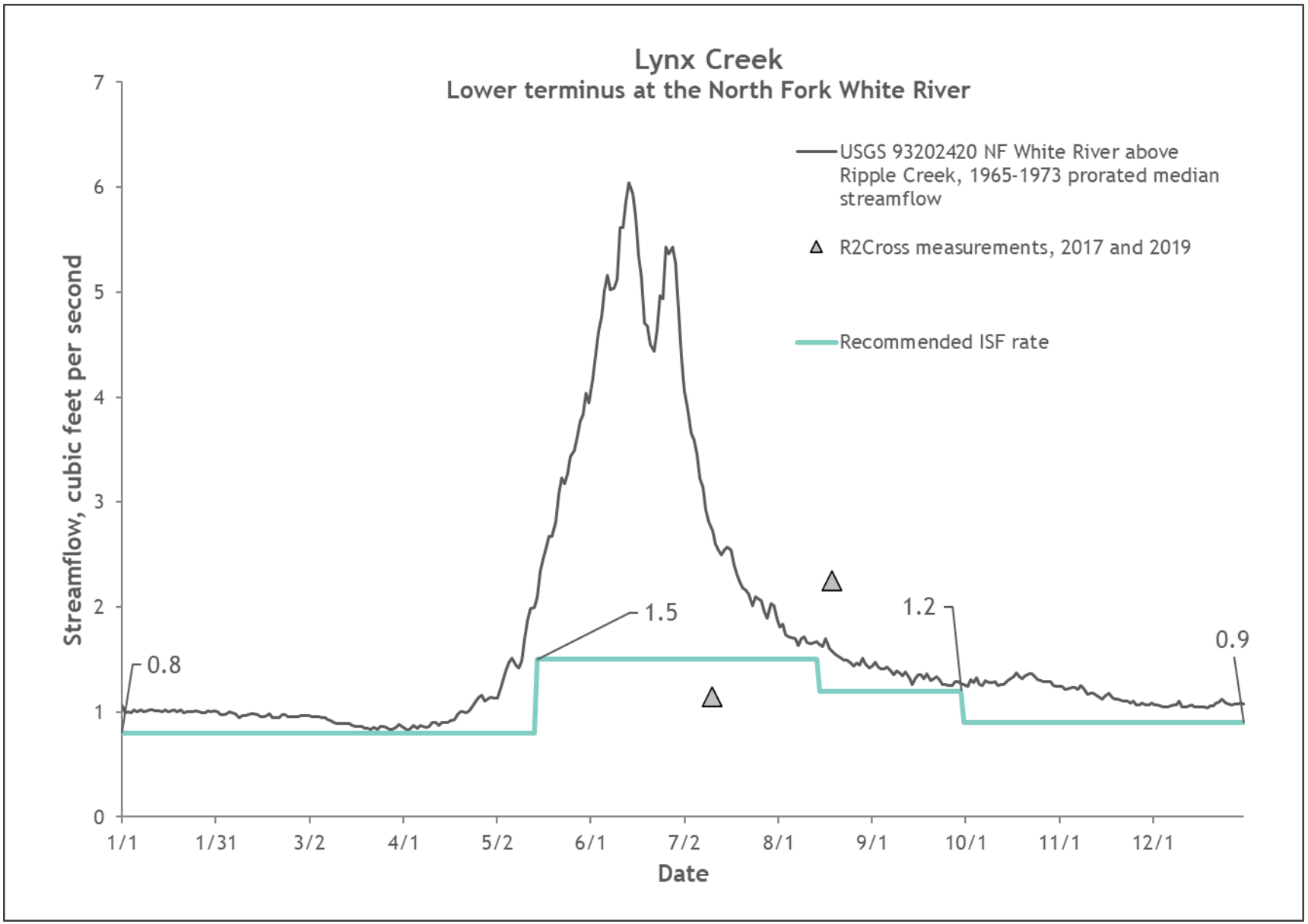
COMPLETE HYDROGRAPH



Picket Pin Creek Executive Summary

CWCB STAFF INSTREAM FLOW RECOMMENDATION
January 26-27, 2026

UPPER TERMINUS:	headwaters in the vicinity of UTM North: 4435803.37 UTM East: 307732.92
LOWER TERMINUS:	confluence North Fork White River at UTM North: 4434082.33 UTM East: 304811.93
WATER DIVISION/DISTRICT:	6/43
COUNTY:	Garfield
WATERSHED:	Upper White
CWCB ID:	18/6/A-012
RECOMMENDER:	Colorado Parks and Wildlife (CPW)
LENGTH:	2.66 miles
FLOW RECOMMENDATION:	0.6 cfs (10/01 - 05/15) 2.2 cfs (05/16 - 07/20) 1.2 cfs (07/21 - 09/30)

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

BACKGROUND

Colorado's General Assembly created the Instream Flow and Natural Lake Level Program in 1973, recognizing "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3), C.R.S.). The statute vests the Colorado Water Conservation Board (CWCB or Board) with the exclusive authority to appropriate and acquire instream flow (ISF) and natural lake level (NLL) water rights. Before initiating a water right filing, the Board must determine that: 1) there is a natural environment that can be preserved to a reasonable degree with the Board's water right if granted, 2) the natural environment will be preserved to a reasonable degree by the water available for the appropriation to be made, and 3) such environment can exist without material injury to water rights.

The information contained in this Executive Summary and the associated supporting data and analyses form the basis for staff's ISF recommendation to be considered by the Board. This Executive Summary provides sufficient information to support the CWCB findings required by ISF Rule 5i on natural environment, water availability, and material injury. Additional supporting information is located at: https://cwcb.colorado.gov/2026-isf-recommendations.

RECOMMENDED ISF REACH

CPW recommended that the CWCB appropriate an ISF water right on a reach of Picket Pin Creek at the ISF Workshop in January, 2017. Picket Pin Creek is located within Garfield County and is approximately 31 miles east of the Town of Meeker (See Vicinity Map). The stream originates near Lost Lake Peak and flows southwesterly until it reaches the confluence with the North Fork White River. Picket Pin Creek is a tributary to the North Fork White River which is a tributary to the White River.

The proposed ISF reach extends from the headwaters downstream to the confluence with the North Fork White River for a total of 2.66 miles. Approximately 85% percent

of the land on the proposed reach is on the White River National Forest and most of the basin is part of the Flat Tops Wilderness Area, with the lower terminus of the proposed reach on the Rio Blanco Ranch (See Land Ownership Map). CPW is recommending an ISF protection on this stream to preserve the natural environment and to fulfill CPW's statutory charge that fish and wildlife resources and their environment should be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors. Securing an ISF water right on this reach will assist in protecting the fishery and conserving fish habitat in alignment with CPW's statutory directive and strategic planning documents.

OUTREACH

Stakeholder input is a valued part of the CWCB staff's analysis of ISF recommendations. Currently, more than 1,100 people subscribe to the ISF mailing list. Notice of the potential appropriation of an ISF water right on Picket Pin Creek was sent to the mailing list in November 2025, March 2025, March 2024, March 2023, March 2022, March 2021, March 2020, November 2019, and March 2019. As this reach is largely within the White River National Forest boundary, the Unites States Forest Service was notified of this recommendation on August 25, 2025. A public notice about this recommendation was also published in the Rifle Citizens Telegram on December 16, 2025

Staff presented information about the ISF program and this recommendation to the Garfield County Board of County Commissioners on November 10, 2025. In addition, staff spoke with Betty Kract, District 43 Lead Water Commissioner, on October 7, 2025 regarding water availability on Picket Pin Creek. Ms. Kract confirmed CWCB staff's understanding of water administration in the Picket Pin Creek catchment area. Finally, staff was in consistent communication with Josh Halstead, the General Manager of Rio Blanco Ranch, to better understand water use practices. Picket Pin Creek teminates on Rio Blanco Ranch and Mr. Halstead is supportive of the protection this recommendation might offer the fisheries that Rio Blanco Ranch utilizes.

NATURAL ENVIRONMENT

CWCB staff relies on the recommending entity to provide information about the natural environment. In addition, staff reviews information and conducts site visits for each recommended ISF appropriation. This information provides the Board with a basis for determining that a natural environment exists.

The Picket Pin Creek watershed is forested in stands of aspen, lodgepole pine, spruce, and conifer. The Creek supports a healthy riparian area with robust plants and mosses, including watercress and nettle. Upland and riparian communities provide plenty of overhead cover and shading of the stream.

Picket Pin Creek is a first to second order stream that is moderate to high gradient. The channel type is typical of a headwaters stream with an entrenched V-shaped channel and substrate that is predominantly medium and coarse cobble. Large cobble and small boulder features create pocket pool habitats for fish. The channel over the observed reach is mainly single thread. There is considerable wood in the creek creating habitat complexity, shading, and nutrient cycling. Much of the aquatic habitat observed by CPW staff includes high gradient riffles, cascades, and pool features that offer good holding habitat.

Fish sampling conducted by CPW in 2016 indicates the stream supports brook trout (Table 1). Macroinvertebrates were noted during R2Cross investigations and include mayflies and caddisfly larvae.

Table 1. List of species identified in Picket Pin Creek.

Species Name	Scientific Name	Status
brook trout	*Salvelinus fontinalis*	None

ISF QUANTIFICATION

CWCB staff relies on the biological expertise of the recommending entity to quantify the amount of water required to preserve the natural environment to a reasonable degree. CWCB staff performs a thorough review of the quantification analyses completed by the recommending entity to ensure consistency with accepted standards.

Quantification Methodology

CPW staff used the R2Cross method to develop the initial ISF recommendation. The R2Cross method is based on a hydraulic model and uses field data collected in a stream riffle (CWCB, 2022; CWCB, 2024). Riffles are the stream habitat type that are most vulnerable to dry if streamflow ceases. The data collected consists of a streamflow measurement, a survey of channel geometry and features at a cross-section, and a survey of the longitudinal slope of the water surface.

The R2Cross model uses Ferguson's Variable-Power Equation (VPE) to estimate roughness and hydraulic conditions at different water stages at the measured cross-section (Ferguson, 2007; Ferguson, 2021). This approach is based on calibrating the model as described in Ferguson (2021). The model is used to evaluate three hydraulic criteria: average depth, average velocity, and percent wetted perimeter. Maintaining these hydraulic parameters at adequate levels across riffle habitat types also will maintain aquatic habitat in pools and runs for most life stages of fish and aquatic macroinvertebrates (Nehring, 1979). CPW staff use the model results to develop an initial recommendation for summer and winter flows. The summer flow recommendation is based on the flow that meets all three hydraulic criteria. The winter flow recommendation is based on the flow that meets two of the three hydraulic criteria.

The R2Cross method estimates the biological amount of water needed for summer and winter periods. The recommending entity uses the R2Cross results and its biological

expertise to develop an initial ISF recommendation. CWCB staff then evaluates water availability for the reach typically based on median hydrology (see the Water Availability section below for more details). The water availability analysis may indicate less water is available than the initial recommendation. In that case, the recommending entity either modifies the magnitude and/or duration of the recommended ISF rates if the available flows will preserve the natural environment to a reasonable degree or withdraws the recommendation.

Data Collection and Analysis

CPW collected R2Cross data at two transects for this proposed ISF reach (Table 2 and Site Map). Results obtained at more than one cross section are averaged to determine the R2Cross flow rate for the stream reach. The R2Cross model results in a winter flow of 0.62 cfs and a summer flow of 2.15 cfs. R2Cross field data and model results can be found in the appendix to this report.

Table 2. Summary of R2Cross cross-section measurements and results for Picket Pin Creek.

Date, XS #	Top Width (feet)	Streamflow (cfs)	Winter Rate (cfs)	Summer Rate (cfs)
07/11/2017, 1	9.0	0.91	0.97	2.15
07/11/2018, 2	4.91	0.12	0.27	2.15
		Average	**0.62**	**2.15**

ISF Recommendation

CPW recommends the following flows based on R2Cross modeling analyses, biological expertise, and staff's water availability analysis.

0.60 cfs is recommended from October 1 through May 15. This flow rate meets two of three hydraulic criteria. This flow rate supports adequate wetted perimeter and depth in the channel to provide sufficient areas of holding habitat necessary to

overwinter fish. It also provides enough water to support longitudinal movement of fish over riffles to overwintering habitat.

2.2 cfs is recommended from May 16 through July 20. This flow rate meets all three hydraulic criteria. However, this summer flow rate time period is shortened due to water availability limitations due to irrigation water diversions from the proposed reach. This flow rate supports adequate depth, velocity, and wetted perimeter criteria which will benefit aquatic habitat availability in riffles, pools, glides, and runs. Ample habitat availability is beneficial to fish during spring and summer periods when fish are active feeding and moving longitudinally throughout the channel.

1.2 cfs is recommended from July 21 through September 30; this flow rate is reduced due to water availability limitations though will provide adequate depth and wetted perimeter for fish passage in late summer. Most trout growth occurs during summer, following peak runoff, when longer days and warmer water temperatures facilitate growth. Late summer is an important period for fish, so increased aquatic habitat availability for fish and macroinvertebrates is beneficial from late July through the end of September.

WATER AVAILABILITY

CWCB staff conducts hydrologic analyses for each recommended ISF appropriation to provide the Board with a basis for determining that water is available.

Water Availability Methodology

Each recommended ISF reach has a unique flow regime that depends on variables such as the timing, magnitude, and location of water inputs (such as rain, snow, and snowmelt) and water losses (such as diversions, reservoirs, evaporation and transpiration, groundwater recharge, etc.). This approach focuses on streamflow and the influence of flow alterations, such as diversions, to understand how much water is physically available in the recommended reach.

Staff's hydrologic analysis is data-driven, meaning that staff gathers and evaluates the best available data and uses the best available analysis method for that data. When available, long-term stream gage data (period of record 20 or more years) are used to evaluate streamflow. Other streamflow information such as short-term gages, temporary gages, spot streamflow measurements, diversion records, and regression-based models are used when long-term gage data is not available or is not representative of the recommended reach. CSUFlow18 is a multiple regression model developed by Colorado State University researchers using streamflow gage data collected between 2001 and 2018 (Eurich et al., 2021). This model estimates mean-monthly streamflow based on drainage basin area, basin terrain variables, and average basin precipitation and snow persistence. Diversion records are used to evaluate the effect of surface water diversions when necessary. Interviews with water commissioners, landowners, and ditch or reservoir operators can provide additional information. A range of analytical techniques may be employed to extend gage records, estimate streamflow in ungaged locations, and estimate the effects of diversions. The goal is to obtain the most detailed and reliable estimate of hydrology using the most efficient analysis technique.

The final product of the hydrologic analysis used to determine water availability is a hydrograph, which shows streamflow and the proposed ISF rate over the course of one year. The hydrograph will show median daily values when daily data is available from gage records; otherwise, it will present mean-monthly streamflow values. Staff will calculate 95% confidence intervals for the median streamflow if there is sufficient data. Statistically, there is 95% confidence that the true value of the median streamflow is located within the confidence interval.

Basin Characteristics

The contributing basin of the proposed ISF on Picket Pin Creek is 1.7 square miles, with an average elevation of 10,177 feet and average annual precipitation of 2.8

inches. Hydrology is largely natural and snowmelt driven with stable baseflows following spring runoff. In the reach there is very limited anthropogenic change to streamflow and the basin has natural hydrology.

Water Rights Assessment

Staff evaluated the existing absolute water rights in the basin tributary to the ISF reach that could affect streamflow in the proposed reach. There are no exchanges within the proposed reach and there is no transbasin water leaving or entering this system. There is only one decreed diversion structure near the lower terminus, the Picket Pin Ditch with a 2.00 cfs water right (appropriation date of 6/2/1958, WDID 4301865). In addition to Picket Pin Ditch, a portion of water decreed to the Lynx Creek Ditch, which is located on Hauskins Creek, is also diverted from Picket Pin Creek. Division of Water Resources (DWR) comments in Colorado Decision Support System (CDSS) indicate that the senior Lynx Creek Ditch water right diverts 1.94 cfs of water from Hauskins Creek and 0.32 cfs from Picket Pin Creek (formally named Hines Creek). Hines Creek appears to be an old name for Picket Pin Creek and this location was confirmed by reviewing the original water court application location map (See Attachments) and by conferring with Water Commissioner Betty Kract (10/8/2025). DWR comments further note that the junior right can divert from either of these streams.

The total diversions from Picket Pin Creek were estimated based on the available information. The Lynx Creek Ditch diversions were partitioned between Hauskins Creek and Picket Pin Creek. The Lynx Creek ditch diversions from Picket Pin Creek were calculated as 0.32 cfs diverted under the senior right and 50% of the total diversions exceeding 2.26 cfs. The total diversions from Picket Pin Creek were calculated as the sum of the Picket Pin Ditch and the diversions from Lynx Creek Ditch attributable to Picket Pin Creek.

Data Collection and Analysis

Representative Gage Analysis

There is not a current or historic streamflow gage on Picket Pin Creek. The closest gage identified was the historic North Fork White River above Ripple Creek near Trappers Lake, CO gage (USGS 093202420). The gage was located approximately 1.9 miles downstream from the confluence with Picket Pin Creek. This gage had a continuous period of record from 10/01/1965 to 9/29/1973. The drainage basin of the North Fork White River gage was 62 square miles, with an average elevation of 10,373 feet and average annual precipitation of 39 inches. A number of water uses upstream from the gage alter hydrology from natural conditions. The basin tributary to the North Fork White River gage includes 53 cfs in surface water diversions (35 cfs is a non-consumptive hydropower diversion), 0.2 cfs in wells, and 438 acre-feet of storage. This summary included the water rights described above on the proposed reach.

The North Fork White River gage record was compared to nearby climate stations to evaluate how the historical record compares to a recent 30 year-record. The closest climate stations with data that included the gage years and the most recent 30 years were both located approximately 33 miles to the west, in Meeker CO (USC00055487, MEEKER NO 2 and USC00055484, MEEKER 3 W). Neither climate station recorded data during the entire North Fork White River gage record. MEEKER 3 W daily precipitation data from 1/1/1965 through 9/30/1970 and MEEKER NO 2 daily precipitation data from 10/1/1970 through 12/31/1984 were combined to evaluate the full period of record for the North Fork White River gage. Staff assumes that these two climate stations, in close proximity, provide similar information. MEEKER 3 W daily precipitation data from 1/1/1995 through 12/31/2024 was used to evaluate recent precipitation conditions.

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above average annual precipitation. During the POR, 1971 was below the 25th percentile for annual precipitation and 1969 was above the 90th percentile annual precipitation. Therefore, when compared to current conditions, the available gage data includes a wide range of climate conditions.

The North Fork White River gage was used to calculate the median daily streamflow which was prorated by 0.02 based on a weighted-area precipitation method to estimate streamflow at the lower terminus of Picket Pin Creek. The median diversions from the Picket Pin Ditch along with additional water diverted under the Lynx Creek Ditch water right, as described above, were then subtracted to estimate streamflow in the proposed reach. This analysis shows that water is available for the flow rates requested.

Site Visit Data

CWCB staff observed Picket Pin Creek in 2018 but did not make any flow measurements.

Water Availability Summary

The hydrograph shows the estimated median daily streamflow for the proposed reach, the diversion adjusted median, and the proposed ISF rate (See Complete Hydrograph). The proposed ISF flow rate is below the diversion adjusted median daily streamflow. Staff conclude that water is available for appropriation on Picket Pin Creek.

MATERIAL INJURY

If decreed, the proposed ISF on Picket Pin Creek would be a new junior water right. This ISF water right can exist without material injury to other senior water rights. Under the provisions of section 37-92-102(3)(b), C.R.S., the CWCB will recognize any uses or exchanges of water in existence on the date this ISF water right is appropriated.

ADDITIONAL INFORMATION

Common Acronyms and Abbreviations

Term	Definition
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cfs	cubic feet per second
CWCB	Colorado Water Conservation Board
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ISF	Instream Flow
NLL	Natural Lake Level
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Citations

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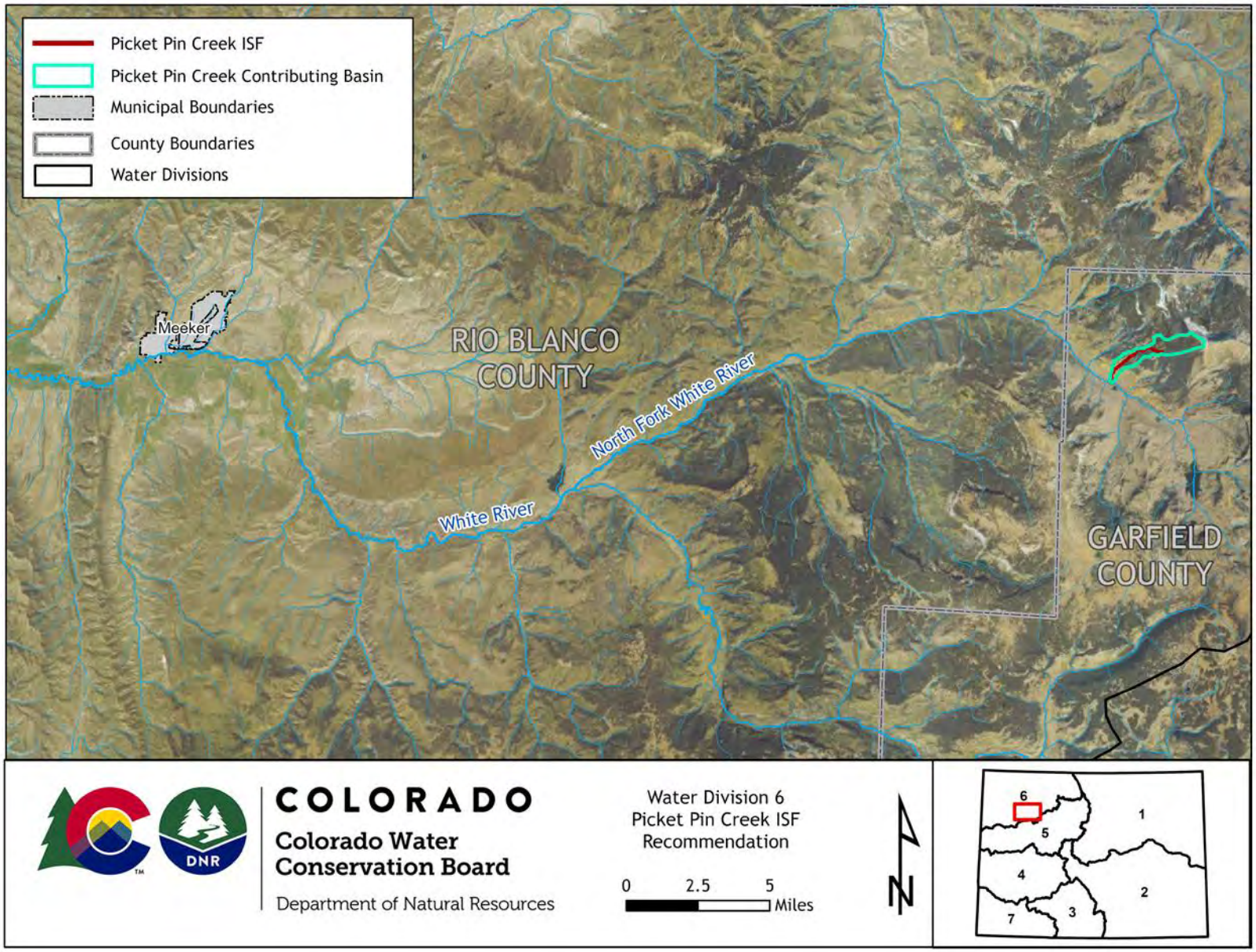
Metadata Descriptions

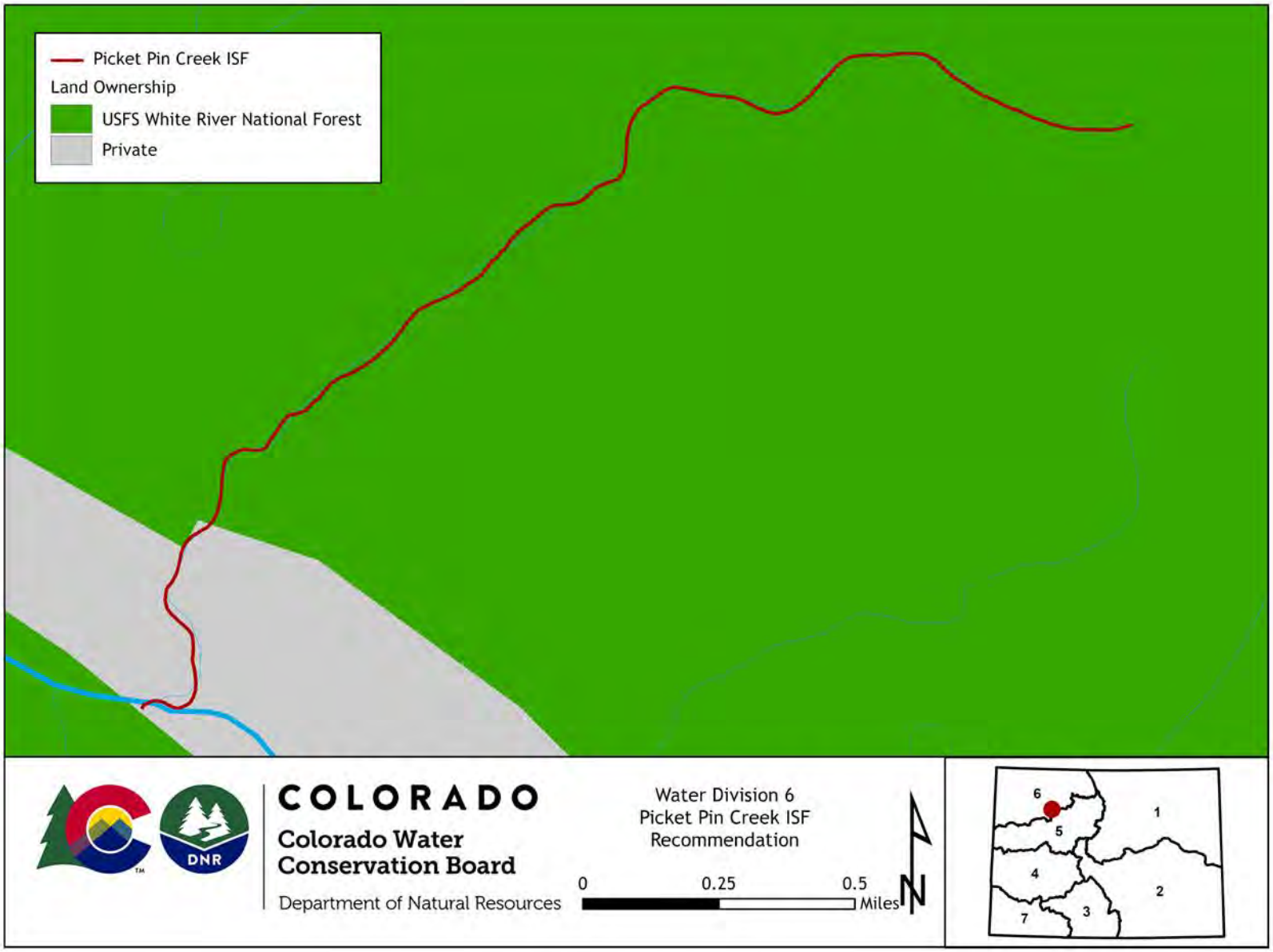
The UTM locations for the upstream and downstream termini were derived from CWCB GIS using the National Hydrography Dataset (NHD).

Projected Coordinate System: NAD 1983 UTM Zone 13N.

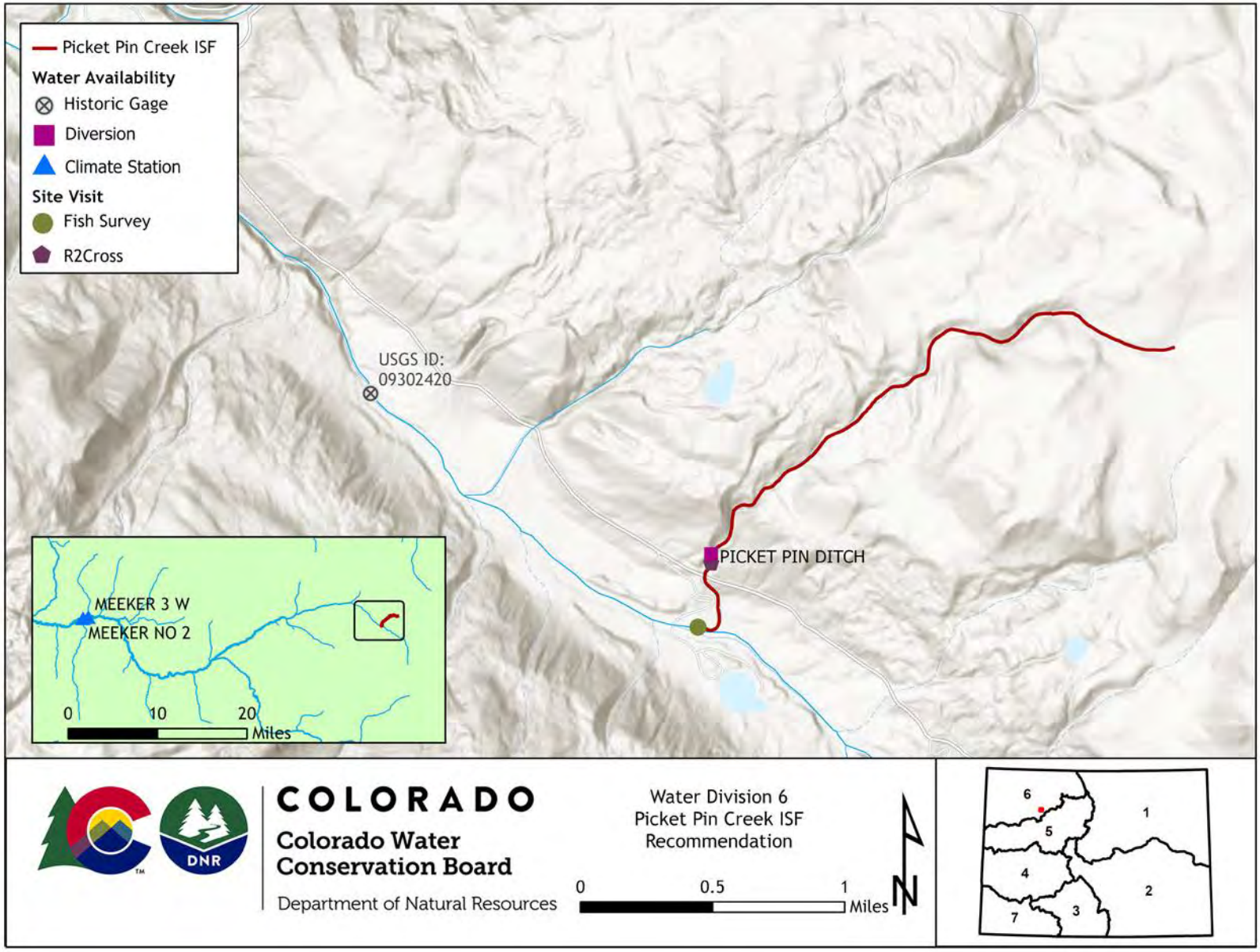
VICINITY MAP



LAND OWNERSHIP MAP



SITE MAP


Picket Pin Creek ISF
Water Availability
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USGS ID:
09302420
PICKET PIN DITCH
MEEKER 3 W
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COLORADO
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Water Division 6
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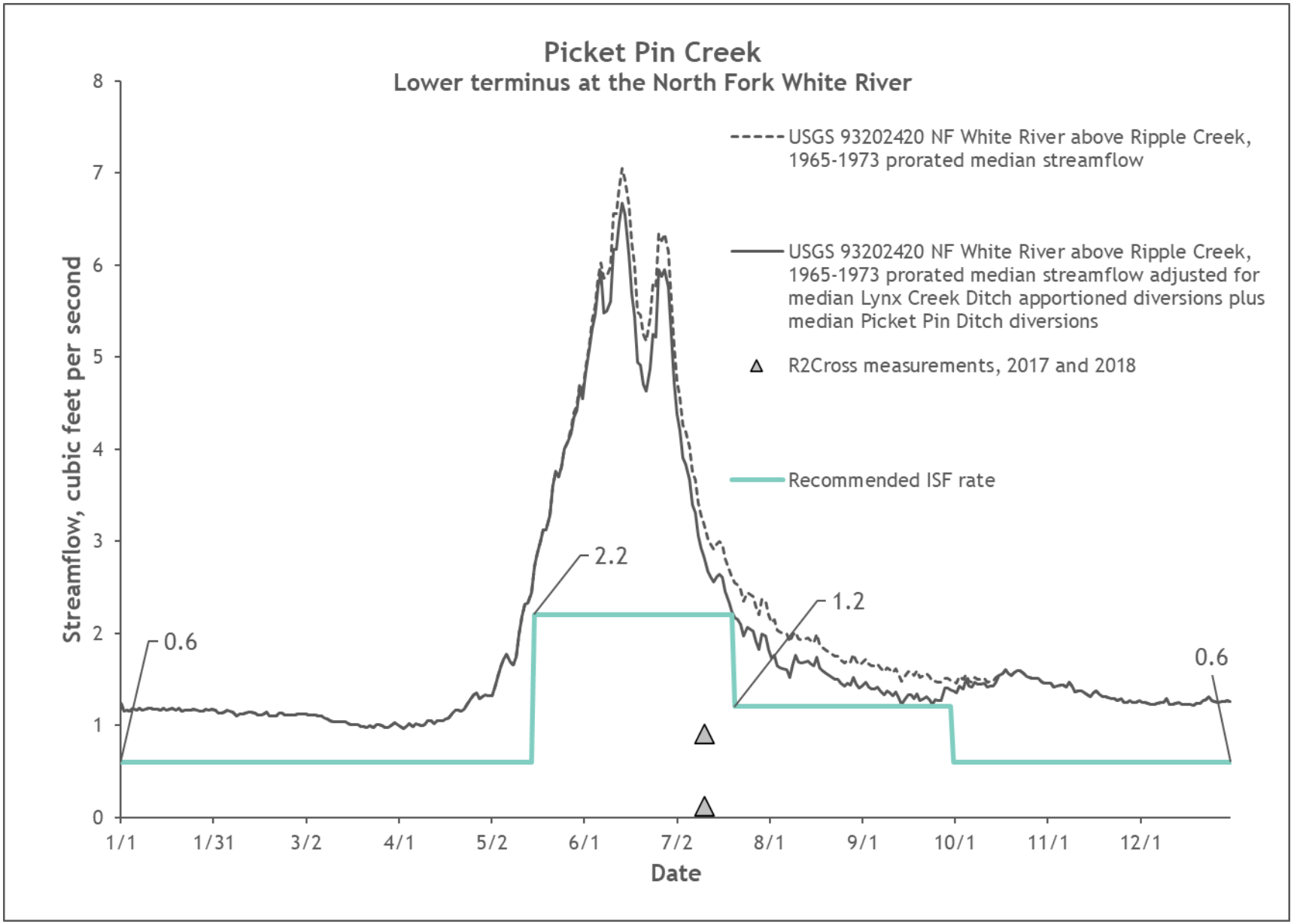
COMPLETE HYDROGRAPH



Pando Creek Executive Summary

CWCB STAFF INSTREAM FLOW RECOMMENDATION
January 26-27, 2026

UPPER TERMINUS:	headwaters in the vicinity of UTM North: 4174104.12 UTM East: 247327.33
LOWER TERMINUS:	confluence with Cascade Creek at UTM North: 4174770.14 UTM East: 249853.36
WATER DIVISION/DISTRICT:	7/30
COUNTY:	San Juan
WATERSHED:	Animas
CWCB ID:	26/7/A-002
RECOMMENDER:	Colorado Parks and Wildlife (CPW)
LENGTH:	1.87 miles
FLOW RECOMMENDATION:	0.4 cfs (9/01 - 03/31) 1.3 cfs (04/01 - 04/30) 3.8 cfs (05/01 - 06/30) 1.1 cfs (07/01 - 08/31)

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

BACKGROUND

Colorado's General Assembly created the Instream Flow and Natural Lake Level Program in 1973, recognizing "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3), C.R.S.). The statute vests the Colorado Water Conservation Board (CWCB or Board) with the exclusive authority to appropriate and acquire instream flow (ISF) and natural lake level (NLL) water rights. Before initiating a water right filing, the Board must determine that: 1) there is a natural environment that can be preserved to a reasonable degree with the Board's water right if granted, 2) the natural environment will be preserved to a reasonable degree by the water available for the appropriation to be made, and 3) such environment can exist without material injury to water rights.

The information contained in this Executive Summary and the associated supporting data and analyses form the basis for staff's ISF recommendation to be considered by the Board. This Executive Summary provides sufficient information to support the CWCB findings required by ISF Rule 5i on natural environment, water availability, and material injury. Additional supporting information is located at: https://cwcb.colorado.gov/2026-isf-recommendations.

RECOMMENDED ISF REACH

CPW recommended that the CWCB appropriate an ISF water right on a reach of Pando Creek at the ISF Workshop in February 2025. Pando Creek is located within San Juan County and is approximately 11 miles east from the Town of Rico (See Vicinity Map). The stream originates near Greyrock Peak and flows east until it reaches the confluence with Cascade Creek. Pando Creek is a tributary to Cascade Creek which is a tributary to the Animas River.

The proposed ISF reach extends from the headwaters downstream to the confluence with Cascade Creek for a total of 1.87 miles. One-hundred percent of the land on the

proposed reach is on the San Juan National Forest (See Land Ownership Map). CPW is recommending ISF protection on this stream to preserve the natural environment and to fulfill CPW's statutory charge that fish and wildlife resources and their environment should be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors. Securing an ISF water right on this reach will assist in protecting the fishery and conserving fish habitat in alignment with CPW's statutory directive and strategic planning documents. Specifically, this stream supports native Colorado River cutthroat trout (CRCT), a Species of Greatest Conservation Need, per CPW's State Wildlife Action Plan (CPW, 2015; SWAP). CPW is committed to taking actions to preserve and protect conservation populations of these species and their watersheds and stream conditions.

OUTREACH

Stakeholder input is a valued part of the CWCB staff's analysis of ISF recommendations. Currently, more than 1,100 people subscribe to the ISF mailing list. Notice of the potential appropriation of an ISF water right on Pando Creek was sent to the mailing list in November 2025, and March 2025. As this reach is entirely within the San Juan National Forest boundary, the Unites States Forest Service was notified of this recommendation on August 25, 2025. A public notice about this recommendation was also published in the Silverton Standard Mine on December 18, 2025.

Staff presented information about the ISF program and this recommendation to the San Juan County Board of County Commissioners on December 15, 2025. The County Commissioners provided a letter of support of the Pando Creek ISF on December 17, 2025. In addition, staff contacted Jeff Titus, Division 7 Lead Water Commissioner for District 30, in December 2025 regarding water availability on Pando Creek. Mr. Titus confirmed there are no water uses on Pando Creek.

NATURAL ENVIRONMENT

CWCB staff relies on the recommending entity to provide information about the natural environment. In addition, staff reviews information and conducts site visits for each recommended ISF appropriation. This information provides the Board with a basis for determining that a natural environment exists.

Pando Creek's watershed is densely forested. The stream is extremely high-gradient, with substrate that ranges from small gravel to large boulder with bedrock outcroppings. Substrate is predominantly medium to large cobbles, but there are small pockets of gravels suitable for spawning. Large boulders and woody debris create excellent step-pool habitat. Fish habitat includes medium pools and excellent cover features like undercut banks and woody debris in the channel. The creek supports healthy riparian and macroinvertebrate communities.

There are a number of full and partial fish barriers along Cascade Creek and Pando Creek near its confluence with Cascade Creek. For this reason, the stream became a candidate to establish a population of San Juan lineage CRCT. From 2021 through 2024, CPW stocked San Juan lineage CRCT with the goal of establishing a core conservation population (Table 1). Follow-up monitoring will be conducted in coming years to assess the population and look for evidence of natural recruitment.

Table 1. List of species identified in Pando Creek.

Species Name	Scientific Name	Status
Colorado River cutthroat trout, San Juan lineage	*Oncorhynchus clarkii pleuriticus*	State - Species of Greatest Conservation Need State - Species of Special Concern

ISF QUANTIFICATION

CWCB staff relies on the biological expertise of the recommending entity to quantify the amount of water required to preserve the natural environment to a reasonable degree. CWCB staff performs a thorough review of the quantification analyses

completed by the recommending entity to ensure consistency with accepted standards.

Quantification Methodology

CPW staff used the R2Cross method to develop the initial ISF recommendation. The R2Cross method is based on a hydraulic model and uses field data collected in a stream riffle (CWCB, 2022; CWCB, 2024). Riffles are the stream habitat type that are most vulnerable to dry if streamflow ceases. The data collected consists of a streamflow measurement, a survey of channel geometry and features at a cross-section, and a survey of the longitudinal slope of the water surface.

The R2Cross model uses Ferguson's Variable-Power Equation (VPE) to estimate roughness and hydraulic conditions at different water stages at the measured cross-section (Ferguson, 2007; Ferguson, 2021). This approach is based on calibrating the model as described in Ferguson (2021). The model is used to evaluate three hydraulic criteria: average depth, average velocity, and percent wetted perimeter. Maintaining these hydraulic parameters at adequate levels across riffle habitat types also will maintain aquatic habitat in pools and runs for most life stages of fish and aquatic macroinvertebrates (Nehring, 1979). CPW staff use the model results to develop an initial recommendation for summer and winter flows. The summer flow recommendation is based on the flow that meets all three hydraulic criteria. The winter flow recommendation is based on the flow that meets two of the three hydraulic criteria.

The R2Cross method estimates the biological amount of water needed for summer and winter periods. The recommending entity uses the R2Cross results and its biological expertise to develop an initial ISF recommendation. CWCB staff then evaluates water availability for the reach typically based on median hydrology (see the Water Availability section below for more details). The water availability analysis may indicate less water is available than the initial recommendation. In that case, the

recommending entity either modifies the magnitude and/or duration of the recommended ISF rates if the available flows will preserve the natural environment to a reasonable degree or withdraws the recommendation.

Data Collection and Analysis

CPW collected R2Cross data at three transects but the discharge measurement was inadvertently not recorded at two transects leaving one transect with all necessary data for this proposed ISF reach (Table 2 and Site Map). The R2Cross model results in a winter flow of 3.66 cfs and a summer flow of 3.82 cfs. R2Cross field data and model results can be found in the appendix to this report.

Table 2. Summary of R2Cross cross-section measurements and results for Pando Creek.

Date, XS #	Top Width (feet)	Streamflow (cfs)	Winter Rate (cfs)	Summer Rate (cfs)
09/04/2024, 1	21.72	1.59	3.66	3.82
		Flow rate	**3.66**	**3.82**

ISF Recommendation

CPW recommends the following flows based on R2Cross modeling analyses, biological expertise, and staff's water availability analysis.

0.4 cfs is recommended from September 1 through March 31. This flow recommendation has been reduced due to water availability constraints but will maintain sufficient holding habitats in deep habitat features like glides and pools. This will support fish during overwintering periods when metabolic activity is limited, and they are overwintering in discrete habitat features (i.e. not moving longitudinally throughout the stream).

1.3 cfs is recommended from April 1 through April 30. This flow recommendation has been reduced due to water availability constraints but will maintain sufficient

velocity and adequate habitat availability in deep habitat features like pools and glides. As snowmelt begins leading up to spring runoff, this flow rate will support increased movement of trout over cascades and step-pool features.

3.8 cfs is recommended from May 1 through June 30. This flow rate meets three of three hydraulic criteria. It maintains adequate depth, velocity, and wetted perimeter during snowmelt runoff and its receding limb when CRCT are actively feeding and spawning. This flow rate supports ideal conditions for CRCT, who spawn in the early months of summer. It also supports sufficient wetted perimeter, depth and velocity to support a productive macroinvertebrate community.

1.1 cfs is recommended from July 1 through August 31. This flow recommendation has been reduced due to water availability limitations but maintains sufficient holding habitat in cascades, pools, and glides. This flow rate will provide rearing and refuge habitats during the critical late summertime period when longer days and warmer water temperature facilitate growth.

WATER AVAILABILITY

CWCB staff conducts hydrologic analyses for each recommended ISF appropriation to provide the Board with a basis for determining that water is available.

Water Availability Methodology

Each recommended ISF reach has a unique flow regime that depends on variables such as the timing, magnitude, and location of water inputs (such as rain, snow, and snowmelt) and water losses (such as diversions, reservoirs, evaporation and transpiration, groundwater recharge, etc.). This approach focuses on streamflow and the influence of flow alterations, such as diversions, to understand how much water is physically available in the recommended reach.

Staff's hydrologic analysis is data-driven, meaning that staff gathers and evaluates the best available data and uses the best available analysis method for that data. When available, long-term stream gage data (period of record 20 or more years) are used to evaluate streamflow. Other streamflow information such as short-term gages, temporary gages, spot streamflow measurements, diversion records, and regression-based models are used when long-term gage data is not available or is not representative of the recommended reach. CSUFlow18 is a multiple regression model developed by Colorado State University researchers using streamflow gage data collected between 2001 and 2018 (Eurich et al., 2021). This model estimates mean-monthly streamflow based on drainage basin area, basin terrain variables, and average basin precipitation and snow persistence. Diversion records are used to evaluate the effect of surface water diversions when necessary. Interviews with water commissioners, landowners, and ditch or reservoir operators can provide additional information. A range of analytical techniques may be employed to extend gage records, estimate streamflow in ungaged locations, and estimate the effects of diversions. The goal is to obtain the most detailed and reliable estimate of hydrology using the most efficient analysis technique.

The final product of the hydrologic analysis used to determine water availability is a hydrograph, which shows streamflow and the proposed ISF rate over the course of one year. The hydrograph will show median daily values when daily data is available from gage records; otherwise, it will present mean-monthly streamflow values. Staff will calculate 95% confidence intervals for the median streamflow if there is sufficient data. Statistically, there is 95% confidence that the true value of the median streamflow is located within the confidence interval.

Basin Characteristics

The contributing basin of the proposed ISF on Pando Creek is 1.8 square miles, with an average elevation of 11,100 feet and average annual precipitation of 37.3 inches.

Hydrology is influenced by snowmelt runoff, monsoonal and late season storms, which maintain perennial baseflows. Hydrology is natural in the proposed reach.

Water Rights Assessment

Staff evaluated the existing absolute water rights in the basin tributary to the ISF reach that could affect streamflow in the proposed reach. Staff did not identify any water rights in the basin that could affect streamflow in the proposed reach. There are no exchanges within the proposed reach and there is no transbasin water leaving or entering this system.

Data Collection and Analysis

Representative Gage Analysis

There is not a current or historic streamflow gage on Pando Creek. The closest gage identified was the current Cascade Creek above Cascade Diversion near Rockwood, CO gage (USGS 09359080; See Site Map). This gage is located approximately 1.6 miles downstream from the confluence with Pando Creek. The gage started operating on 11/1/2011 and is still in continuous operation. The drainage basin of the Cascade Creek gage is 26 square miles, with an average elevation of 11,181 feet and average annual precipitation of 45.2 inches. The basin tributary to the Cascade Creek gage appears to be largely free of any major diversions or water uses.

The Cascade Creek gage record was compared to nearby climate stations to evaluate how the existing record compares to a longer 30 year-record. The closest climate station with a period of record (POR) that includes the gage years through present is in the nearby Mill Creek basin, approximately 2.7 miles south from the proposed lower terminus on Pando Creek (USS0007M35S, Cascade Number 2; See Site Map). Years with substantially complete data sets from 1995 to 2024 were used to evaluate recent precipitation conditions. When compared to the last 30 years, the existing Cascade Creek gage (2011-2025) had lower annual precipitation statistics for 25th percentile, 75th percentile, median, and average than the previous 30-year period. Therefore, the

more current climate conditions recorded by the Cascade Creek gage are likely to reflect lower water availability than a longer-term record.

The Cascade Creek gage was used to calculate the median daily streamflow which was prorated by 0.07 based on a weighted-area precipitation method to estimate streamflow at the lower terminus of Pando Creek. For some portions of the year there was sufficient data to calculate 95% confidence intervals for the median; however, this was not possible for the entire year. The analysis of median streamflow shows that water is available for the flow rates during early summer to early fall; the upper 95% confidence interval shows that water is available during the baseflow periods from October to March.

Site Visit Data

CWCB staff assisted with R2Cross on Pando Creek but did not make additional streamflow measurements.

Water Availability Summary

The hydrograph shows the prorated median daily streamflow, 95% confidence intervals for the prorated median daily streamflow, and the proposed ISF rate (See Complete Hydrograph). The proposed ISF flow rate is below the median daily streamflow or the 95% confidence interval. Staff conclude that water is available for appropriation on Pando Creek.

MATERIAL INJURY

If decreed, the proposed ISF on Pando Creek would be a new junior water right. This ISF water right can exist without material injury to other senior water rights. Under the provisions of section 37-92-102(3)(b), C.R.S., the CWCB will recognize any uses or exchanges of water in existence on the date this ISF water right is appropriated.

ADDITIONAL INFORMATION

Common Acronyms and Abbreviations

Term	Definition
ac-ft	acre feet
BLM	Bureau of Land Management
cfs	cubic feet per second
CWCB	Colorado Water Conservation Board
CPW	Colorado Parks and Wildlife
CRCT	Colorado River cutthroat trout
DWR	Division of Water Resources
HCCA	High Country Conservation Advocates
ISF	Instream Flow
NLL	Natural Lake Level
SWAP	State Wildlife Action Plan
USGS	United States Geological Survey
USFS	United States Forest Service
XS	Cross section

Citations

Colorado Parks and Wildlife, 2015, State Wildlife Action Plan: A strategy for conserving wildlife in Colorado. https://cpw.widencollective.com/assets/share/asset/nbenjdfemj

Colorado Water Conservation Board, 2022, R2Cross model- User's manual and technical guide. https://r2cross.erams.com/

Colorado Water Conservation Board, 2024, R2Cross field manual. https://dnrweblink.state.co.us/cwcbsearch/0/edoc/224685/R2Cross%20Field%20Manual%202024.pdf

Eurich, A., Kampf, S.K., Hammond, J.C., Ross, M., Willi, K., Vorster, A.G. and Pulver, B., 2021, Predicting mean annual and mean monthly streamflow in Colorado ungauged basins, River Research and Applications, 37(4), 569-578.

Ferguson, R.I., 2007. Flow resistance equations for gravel- and boulder-bed streams. Water Resources Research 43. https://doi.org/10.1029/2006WR005422

Ferguson, R.I., 2021. Roughness calibration to improve flow predictions in coarse-bed streams. Water Res 57. https://doi.org/10.1029/2021WR029979

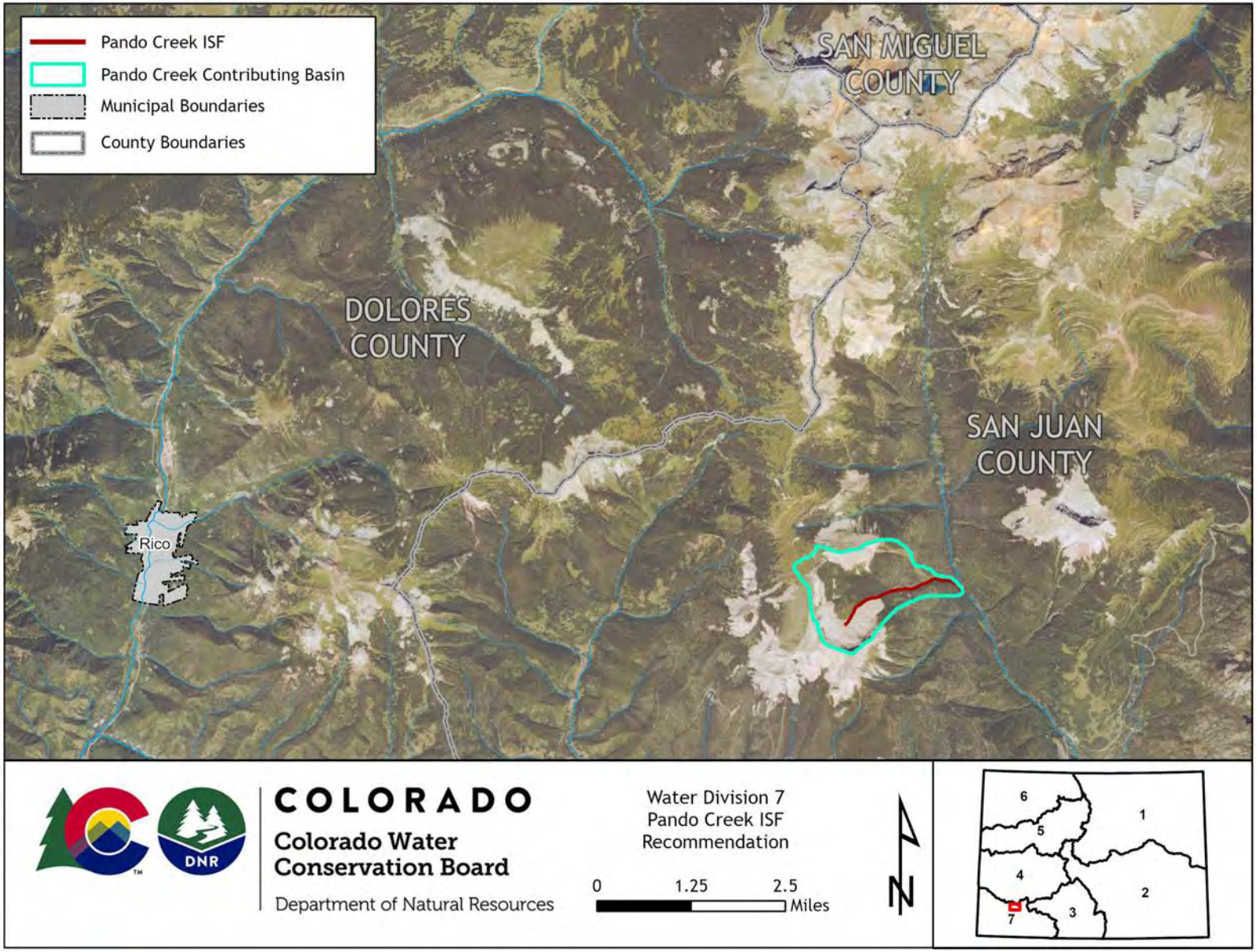
Nehring, B.R., 1979, Evaluation of instream flow methods and determination of water quantity needs for streams in the state of Colorado, Colorado Division of Wildlife.

Metadata Descriptions

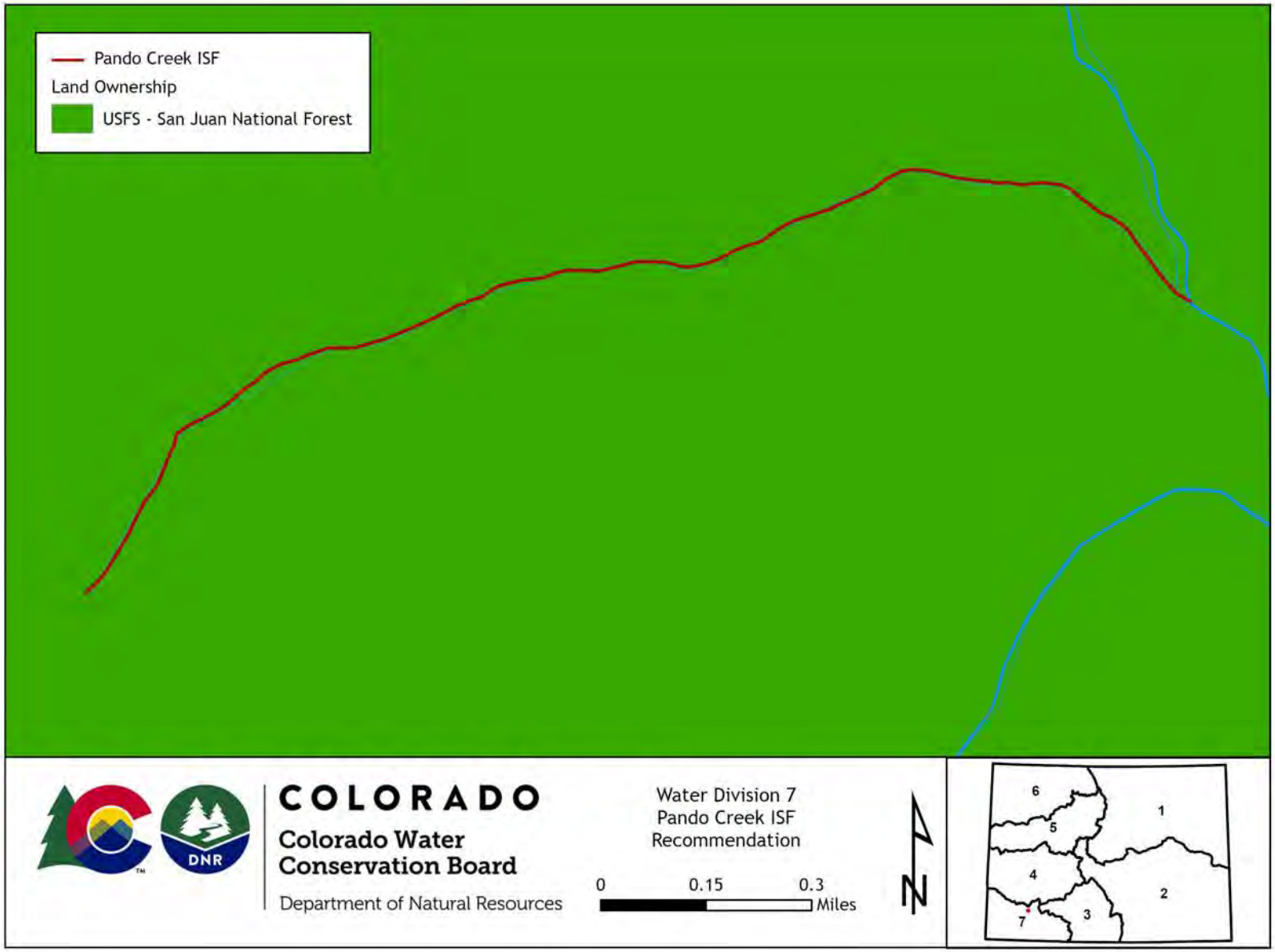
The UTM locations for the upstream and downstream termini were derived from CWCB GIS using the National Hydrography Dataset (NHD).

Projected Coordinate System: NAD 1983 UTM Zone 13N.

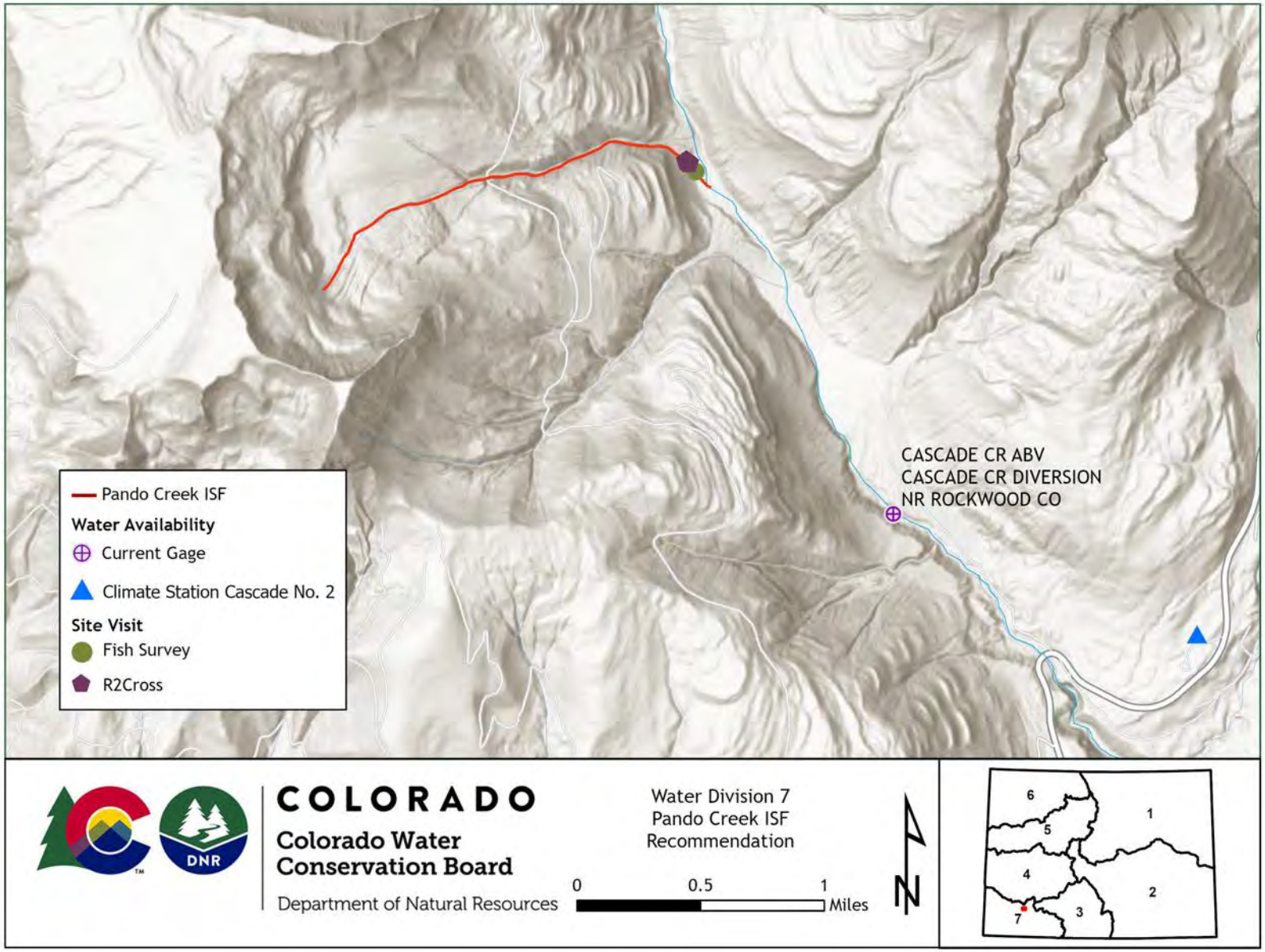
VICINITY MAP



LAND OWNERSHIP MAP



SITE MAP


Pando Creek ISF
Water Availability
Current Gage
Climate Station Cascade No. 2
Site Visit
Fish Survey
R2Cross
CASCADE CR ABV
CASCADE CR DIVERSION
NR ROCKWOOD CO
COLORADO
Colorado Water
Conservation Board
Department of Natural Resources
Water Division 7
Pando Creek ISF
Recommendation
0
0.5
1
Miles
N
6
1
5
4
2
7
3

COMPLETE HYDROGRAPH