Colorado's Instream Flow and Natural Lake Level Program

Colorado Water Conservation Board
Stream and Lake Protection Section

East Fork Little Cimarron Creek

CWCB

To promote the protection, conservation, and development of Colorado's water resources for present and future generations

Provides policy direction on water issues

- Finance and Administration
- Interstate & Federal
- Stream and Lake Protection
- Water Supply Planning
- Watershed & Flood Protection

Ex-Officio Members:

Bob Randall, DNR Director *(voting)*

Rebecca Mitchell, CWCB Director

Cynthia Coffman, AG

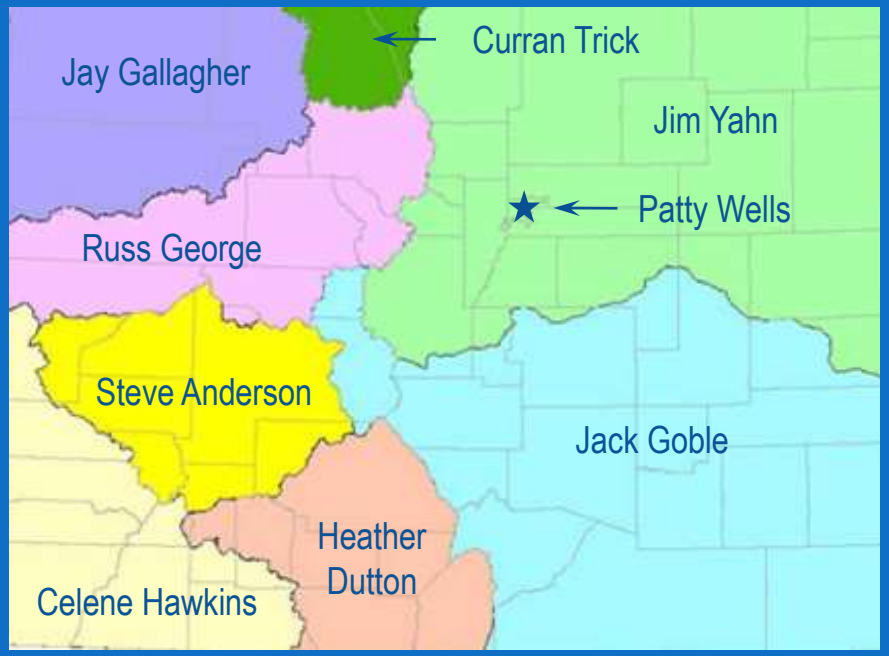
Kevin Rein, State Engineer

Bob Broscheid, CPW Director

Don Brown, Dept. of Ag Director

John Stulp, Special Policy Advisor to the Governor for water

Board of directors



Stream and Lake Protection Section

New Appropriations

Appropriate and adjudicate a new (junior) ISF water right for the minimum required to preserve the natural environment to a reasonable degree

Water Acquisitions

Acquire existing water rights and change to ISF use in amounts CWCB determines appropriate to preserve or improve the natural environment to a reasonable degree

Monitoring and Request for Administration

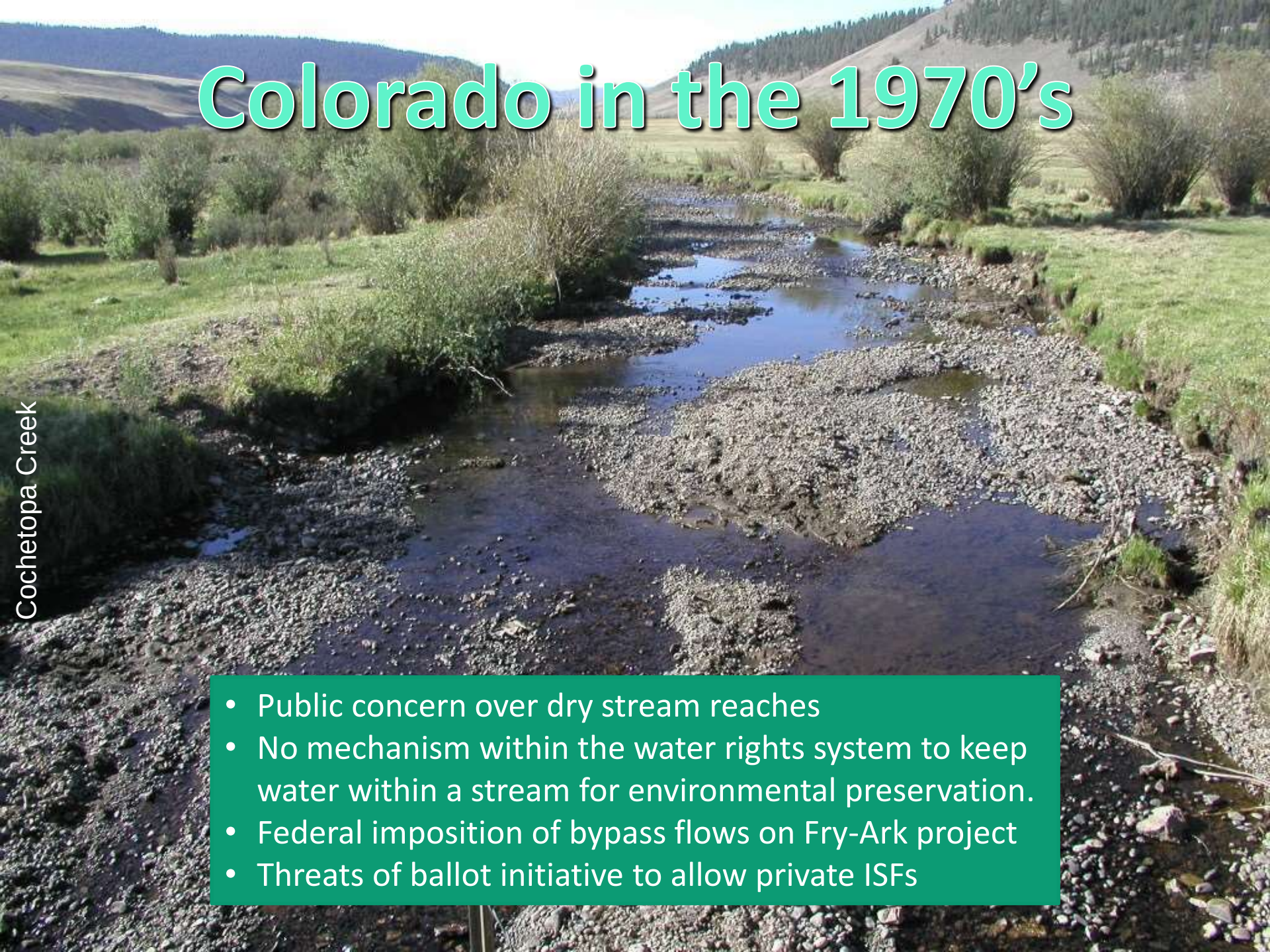
Actively monitor conditions at stream gages and initiate administrative calls as necessary to ensure ISF rights are met.

Legal Protection

Initiating legal action through Colorado's water courts when necessary to provide 100% protections of the state's decreed ISF rights.

Inter-Section Issues –
DSS, Wild and Scenic, State Water Plan, River Restoration, Stream Management Plans, and Stream gaging, etc.

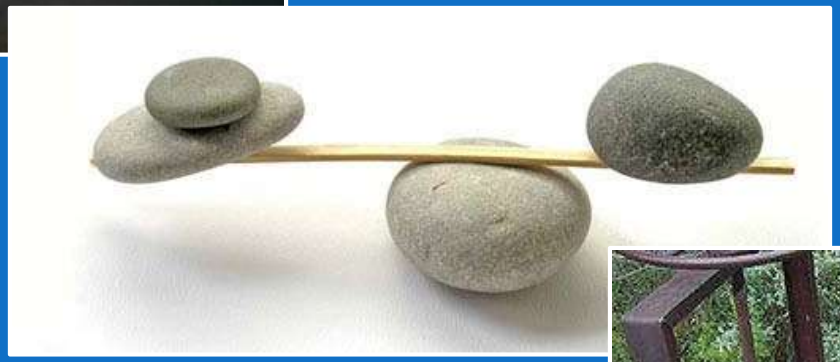
Colorado in the 1970's



- Public concern over dry stream reaches
- No mechanism within the water rights system to keep water within a stream for environmental preservation.
- Federal imposition of bypass flows on Fry-Ark project
- Threats of ballot initiative to allow private ISFs

Colorado's Legislature Weighs In

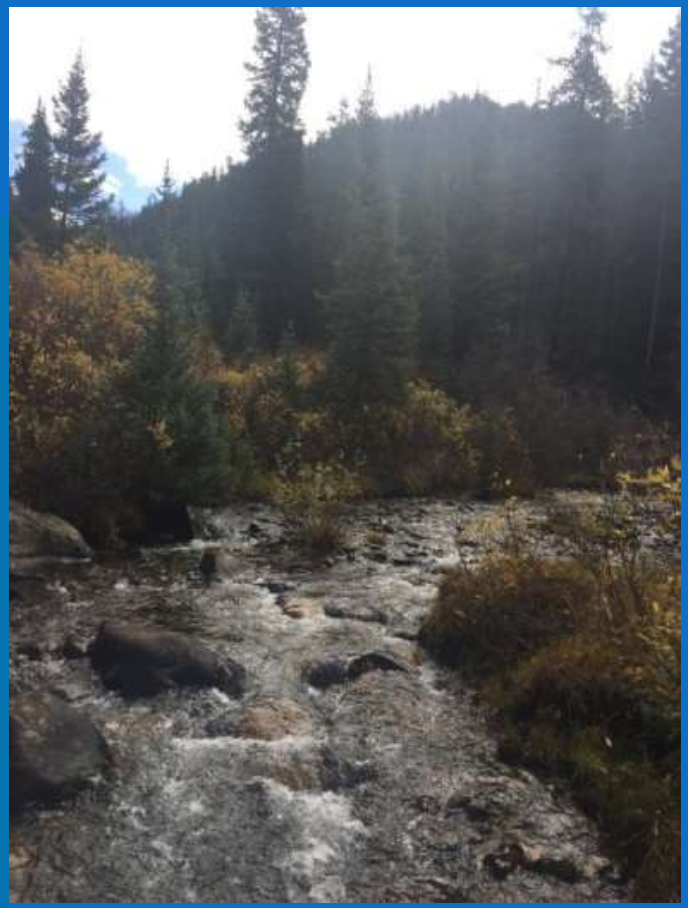
Maintain flows in streams to ensure reasonable preservation of the natural environment and achieve a balance with other beneficial uses of water in the state.



Provide regulatory certainty for water users through continued reliance on the doctrine of prior appropriation.

In 1973, the Colorado Legislature established the Instream Flow Program with the passage of Senate Bill 97:

- *Recognized "the need to correlate the activities of mankind with some reasonable preservation of the natural environment"*
- *Vested the Colorado Water Conservation Board with the authority "on behalf of the people of the state of Colorado, to appropriate or acquire… such waters of natural streams and lakes as may be required to preserve the natural environment to a reasonable degree."*



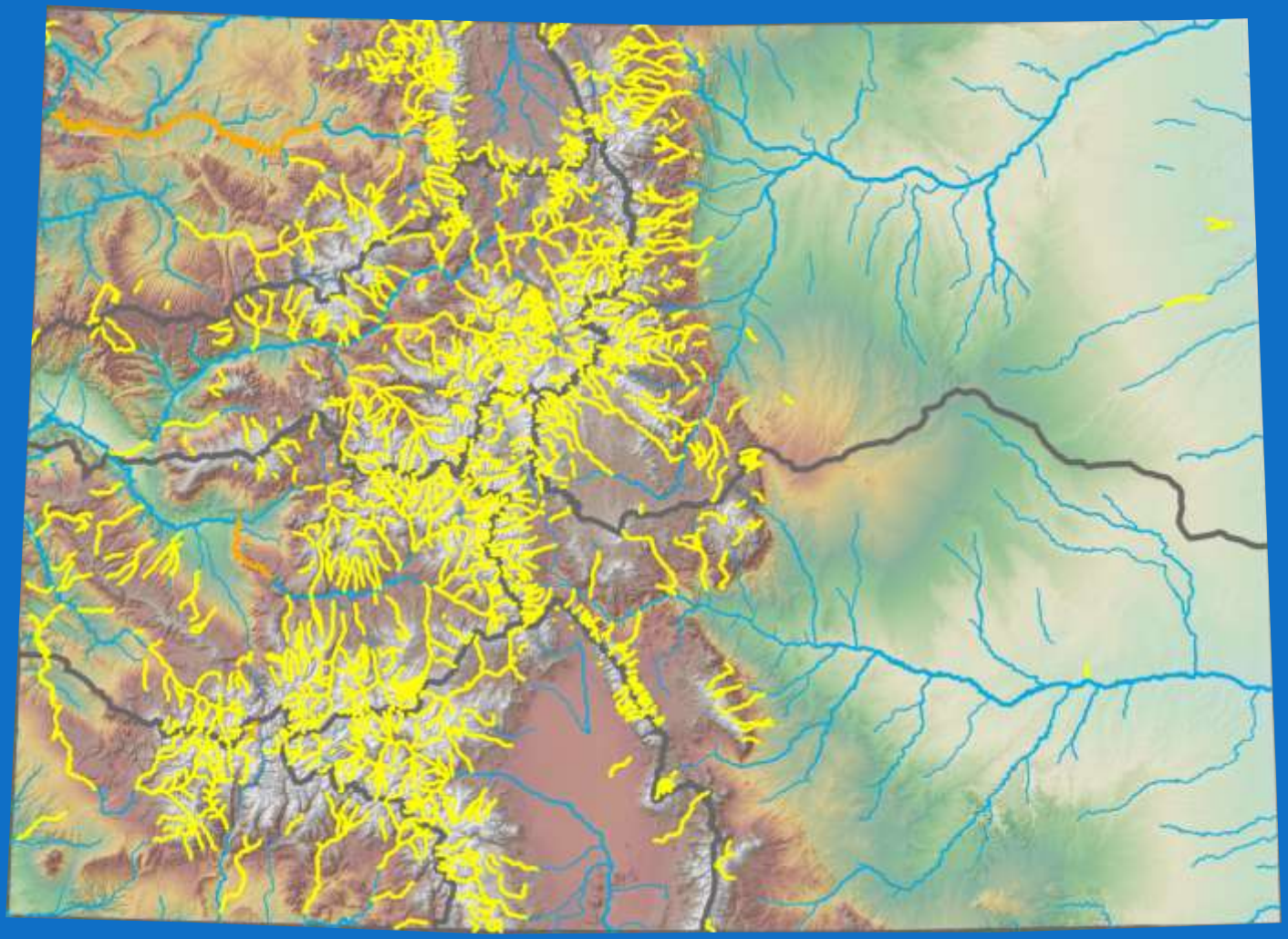
Gold Creek

What did the ISF legislation establish?

- ISF and NLL rights are "in-channel" or "in-lake" appropriations of water and are recognized beneficial uses of water.
- Made exclusively by the Colorado Water Conservation Board
- To preserve the natural environment to a reasonable degree
- For "minimum flows" between specific points on a stream, or "levels" on natural lakes
- Administered within the State's water right priority system
- Entitled to stream conditions existing at time of appropriation

East Fork Little Cimarron

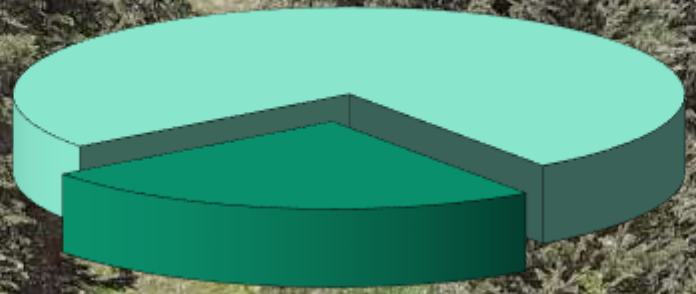
Distribution of Existing ISF Water Rights in Colorado



Yellow lines represent streams with decreed ISF rights

ISF Program Statistics

39,479 miles of perennial streams



Appropriated

Instream flow water rights on

- over **1,700** stream segments,
- covering **9,535** miles of stream,
  - and **482** natural lakes

Acquired

Over **43** water right donations or long-term contracts for water totaling

945 stream miles

East Fork Little Cimarron Creek

New Appropriations

(ISF Rule 5 Procedure)

Any ***person*** or ***entity*** may recommend streams or lakes to be considered for appropriation to ***preserve*** the natural environment

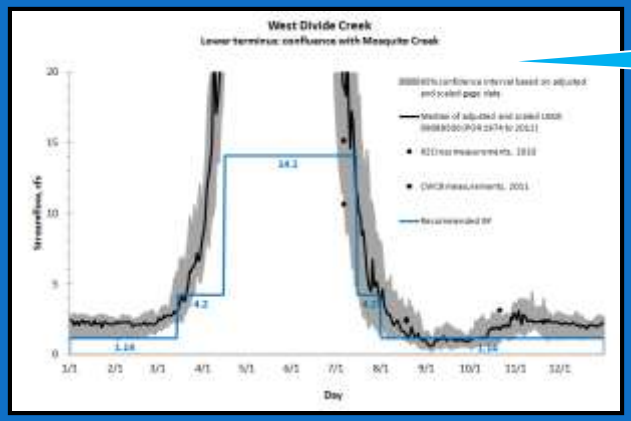
Gold Creek

Required Board Findings

A natural environment exists

- Typically identified by the presence of a fishery, but other indicators can be used

  Note: Quantification of the amount of water needed is provided by the recommending entity.



Natural environment will be preserved by the water available for appropriation

- Determined by water right and hydrologic investigations
- Daily **Median** hydrology when available – general CWCB policy to show water available 50% of time

No material injury to other rights

- New appropriations are junior water rights and have no effect on existing senior appropriations
- 37-92-102(3) b. Recognition of existing undecreed uses and exchanges

Natural Environment

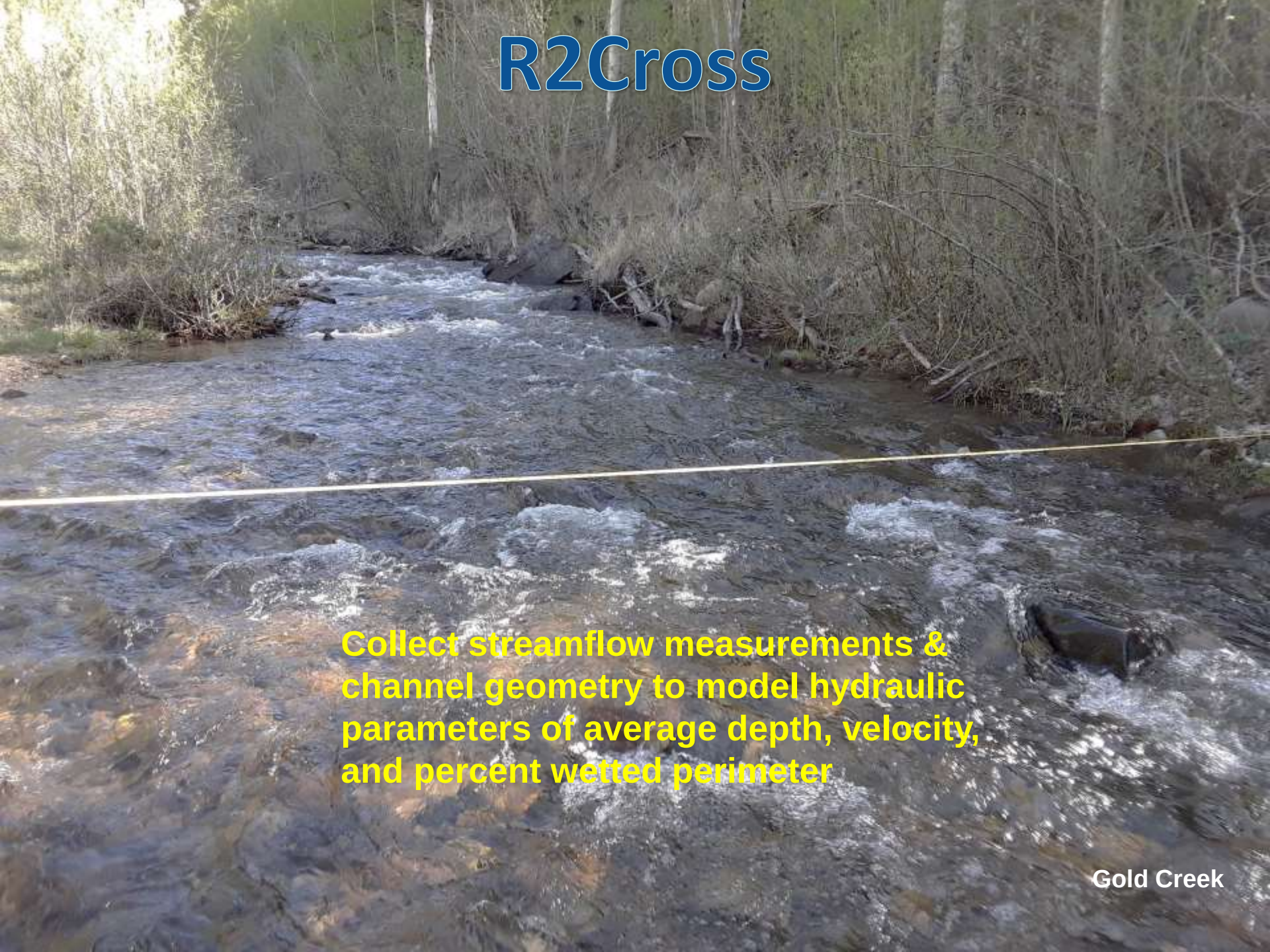
There is a natural environment that can be preserved to a reasonable degree

When we try to pick out anything by itself, we find it hitched to everything else in the universe.

John Muir

Central stoneroller Nate Cathcart photo 2010

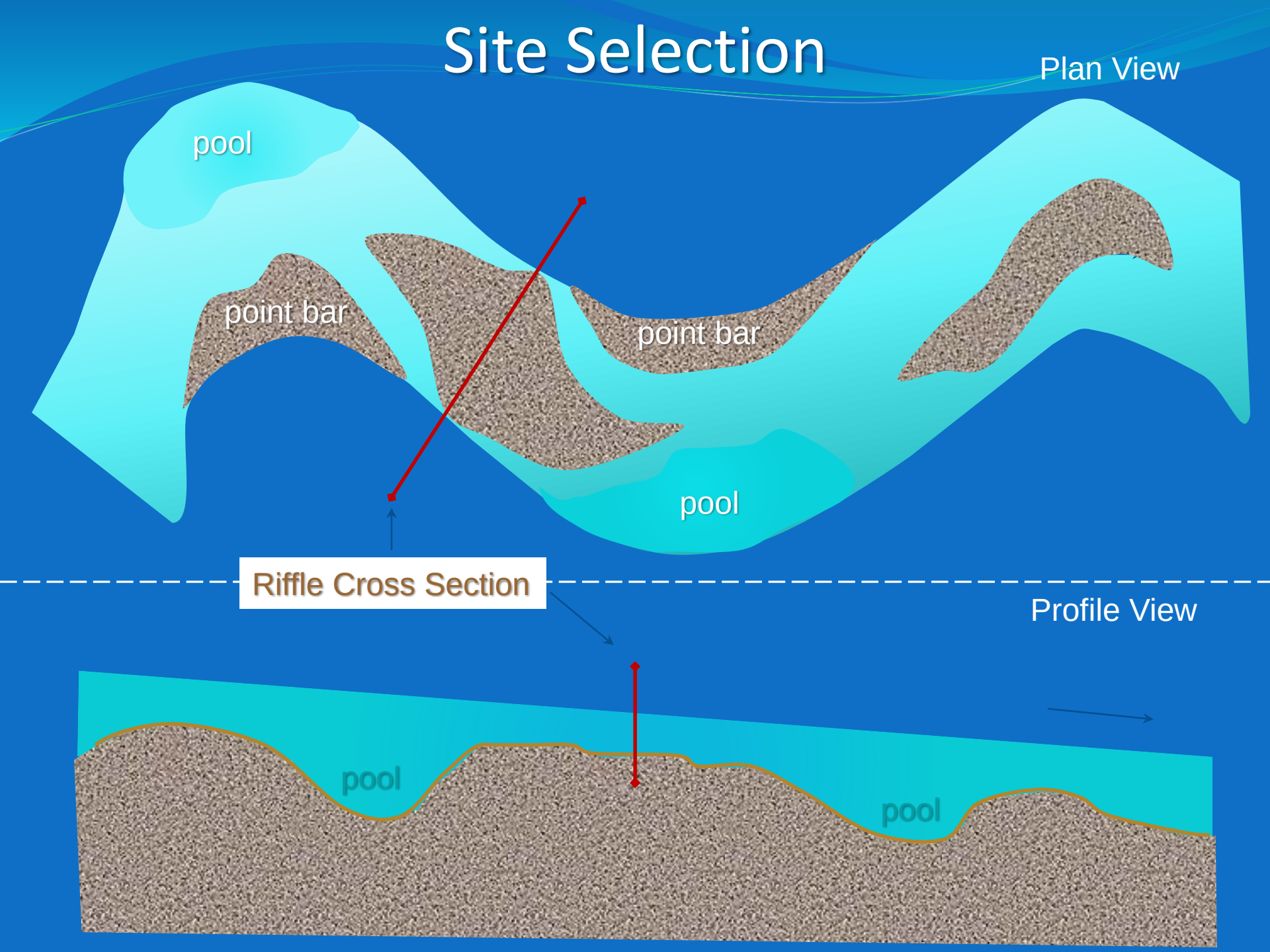
R2Cross



Collect streamflow measurements & channel geometry to model hydraulic parameters of average depth, velocity, and percent wetted perimeter

Gold Creek

Site Selection



R2CROSS Parameters

- Biological R2CROSS recommendation based on maintaining hydraulic parameters related to stream habitat preferences for fish.
- 3 of 3 required for summer flow; 2 of 3 required for winter flow
- Many original R2Cross recommendations were based solely on 2 of 3

Stream Width (ft)	Average Depth (ft)	Average Velocity (ft/sec)	Wetted Perimeter (%)
1 - 20	0.2	1.0	50
21 - 40	0.21 - 0.40	1.0	50
41 - 60	0.41 - 0.60	1.0	50 - 60
61 - 100	0.61 - 1.00	1.0	70 or greater

Requirements Using R2CROSS Transect Method (Nehring 1979)

Computations

Manning's Equation

$$Q = \frac{1.486 * A * R^{2/3} * S^{1/2}}{n}$$

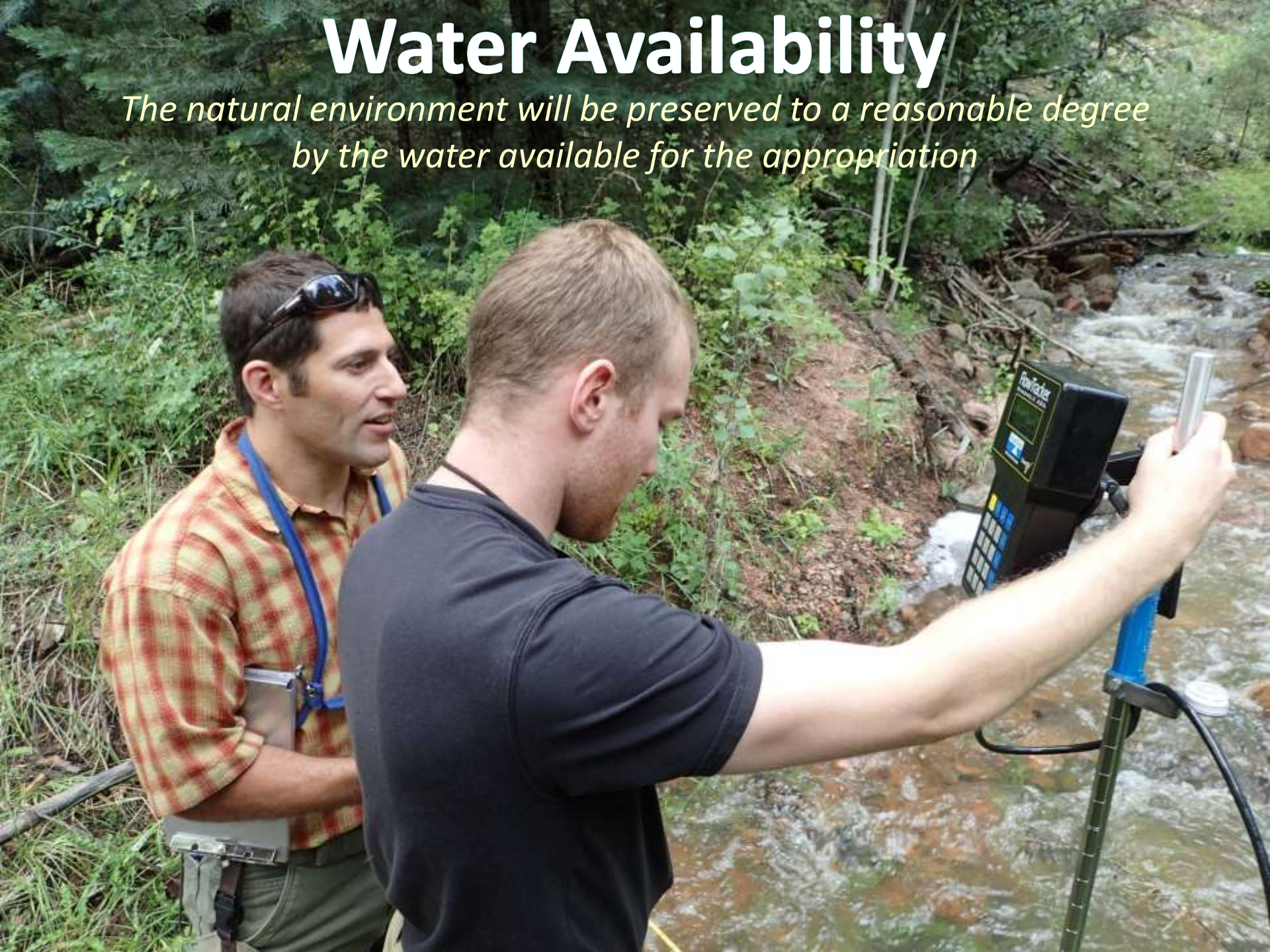
where:

Q = discharge (cfs)
A = cross-sectional area (ft)
R = hydraulic radius (ft)
S = slope (ft/ft)
n = Manning's n, a coefficient of roughness

DIST TO WATER (FT)	TOP WIDTH (FT)	AVG. DEPTH (FT)	MAX. DEPTH (FT)	AREA (SQ FT)	WETTED PERIM. (FT)	PERCENT WET PERIM (%)	HYDR RADIUS (FT)	FLOW (CFS)	AVG. VELOCITY (FT/SEC)
1.55	37.12	1.21	1.7	44.95	37.97	100.00%	1.18	61.22	1.36
1.56	37.08	1.2	1.69	44.66	37.93	99.90%	1.18	60.6	1.36
1.61	36.88	1.16	1.64	42.81	37.69	99.30%	1.14	56.71	1.32
1.66	36.68	1.12	1.59	40.97	37.45	98.60%	1.09	52.94	1.29
1.71	36.48	1.07	1.54	39.14	37.2	98.00%	1.05	49.27	1.26
1.76	36.28	1.03	1.49	37.32	36.96	97.40%	1.01	45.71	1.22
1.81	36.09	0.98	1.44	35.51	36.72	96.70%	0.97	42.26	1.19
1.86	35.89	0.94	1.39	33.71	36.48	96.10%	0.92	38.93	1.15
1.91	35.69	0.89	1.34	31.92	36.24	95.40%	0.88	35.7	1.12
1.96	35.49	0.85	1.29	30.14	36	94.80%	0.84	32.59	1.08
2.01	35.14	0.81	1.24	28.38	35.61	93.80%	0.8	29.68	1.05
2.06	34.78	0.77	1.19	26.63	35.21	92.70%	0.76	**26.9**	**1.01**
2.11	34.42	0.72	1.14	24.9	34.81	91.70%	0.72	**24.24**	**0.97**
2.16	34.06	0.68	1.09	23.19	34.41	90.60%	0.67	21.69	0.94
2.21	33.64	0.64	1.04	21.49	33.98	89.50%	0.63	19.28	0.9
2.26	32.76	0.61	0.99	19.83	33.08	87.10%	0.6	17.16	0.87
2.31	31.93	0.57	0.94	18.22	32.23	84.90%	0.57	15.16	0.83
2.36	31.38	0.53	0.89	16.63	31.66	83.40%	0.53	13.18	0.79
2.41	30.83	0.49	0.84	15.08	31.09	81.90%	0.49	11.33	0.75
2.46	30.18	0.45	0.79	13.55	30.43	80.10%	0.45	9.62	0.71
2.51	27.55	0.44	0.74	12.08	27.79	73.20%	0.43	8.44	0.7
2.56	26.42	**0.41**	0.69	10.73	26.66	70.20%	0.4	**7.12**	0.66
2.61	25.29	**0.37**	0.64	9.44	25.52	67.20%	0.37	**5.92**	0.63
2.66	23.62	0.35	0.59	8.24	23.85	62.80%	0.35	4.94	0.6
2.71	22.86	0.31	0.54	7.07	23.08	60.80%	0.31	3.91	0.55
2.76	21.07	0.28	0.49	5.99	21.28	56.10%	0.28	3.13	0.52
2.81	20.27	0.24	0.44	4.96	20.47	53.90%	0.24	2.35	0.47
2.86	19.52	0.2	0.39	3.96	19.72	**51.90%**	0.2	1.66	0.42
2.91	18.73	0.16	0.34	3.01	18.92	**49.80%**	0.16	1.07	0.36
2.96	17.41	0.12	0.29	2.1	17.57	46.30%	0.12	0.62	0.3
3.01	13.93	0.09	0.24	1.28	14.07	37.00%	0.09	0.31	0.25
3.06	10.03	0.07	0.19	0.69	10.13	26.70%	0.07	0.14	0.2
3.11	6.81	0.04	0.14	0.27	6.87	18.10%	0.04	0.04	0.14
3.16	2.11	0.02	0.09	0.05	2.13	5.60%	0.02	0.01	0.1
3.21	0.38	0.02	0.04	0.01	0.39	1.00%	0.02	0	0.09

Water Availability

The natural environment will be preserved to a reasonable degree by the water available for the appropriation



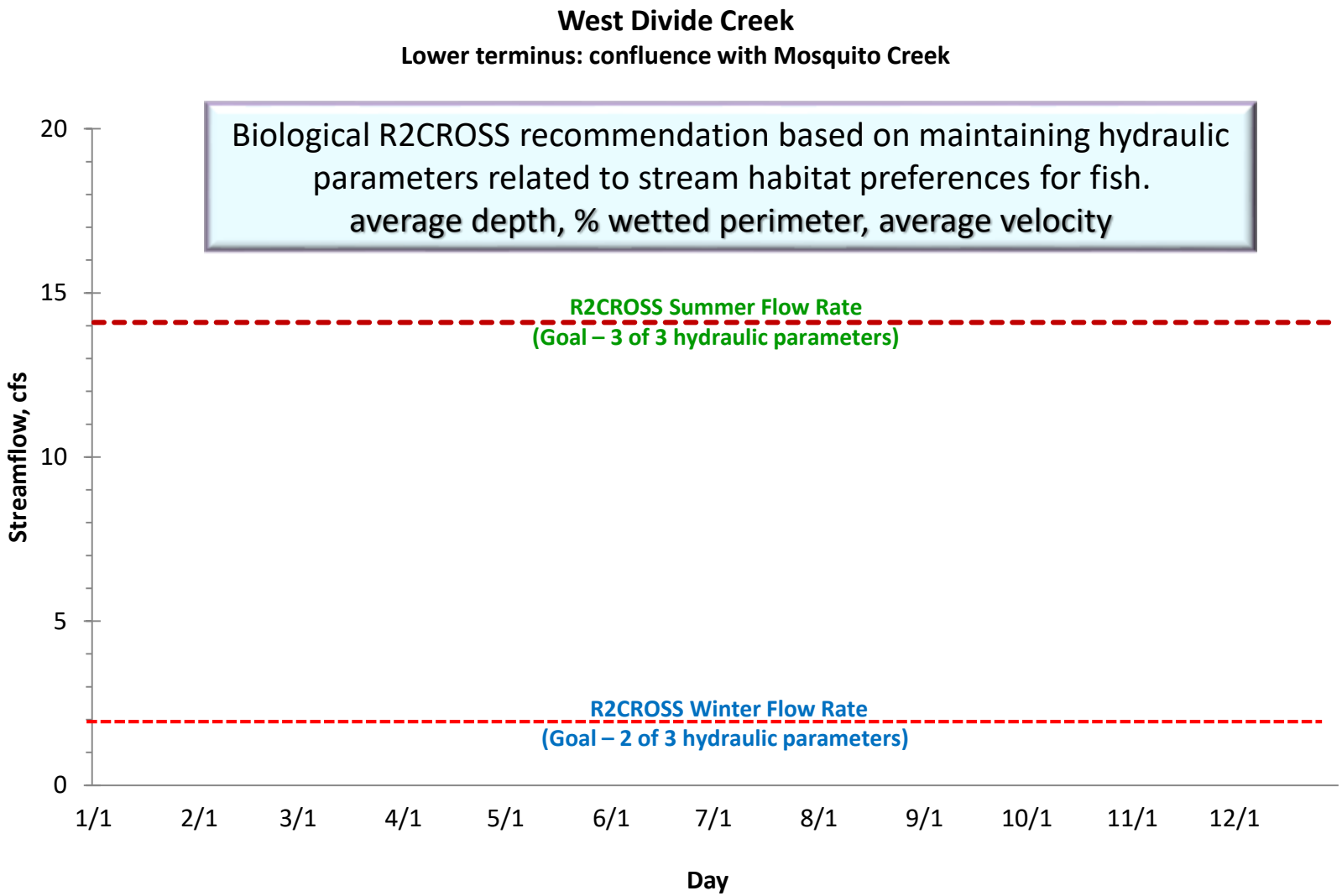
Hydrologic analyses for Water Availability

Water Balance approach, driven by best available data

- ✓ Statistical analysis of data to provide *median* daily flow hydrograph when possible.
- ✓ Gage Records +20 years, short term gages, temporary gages, spot flow measurements, diversion records.
- ✓ StreamStats analysis to provide mean monthly hydrograph when data is limited.
- ✓ Detailed CDSS modeling on larger streams.
- ✓ Additional information from water commissioners, land owners, ditch or reservoir operators, resource managers.

Water availability can be viewed as a necessary refinement that may impose limitations on biological quantification model findings.

Water Availability



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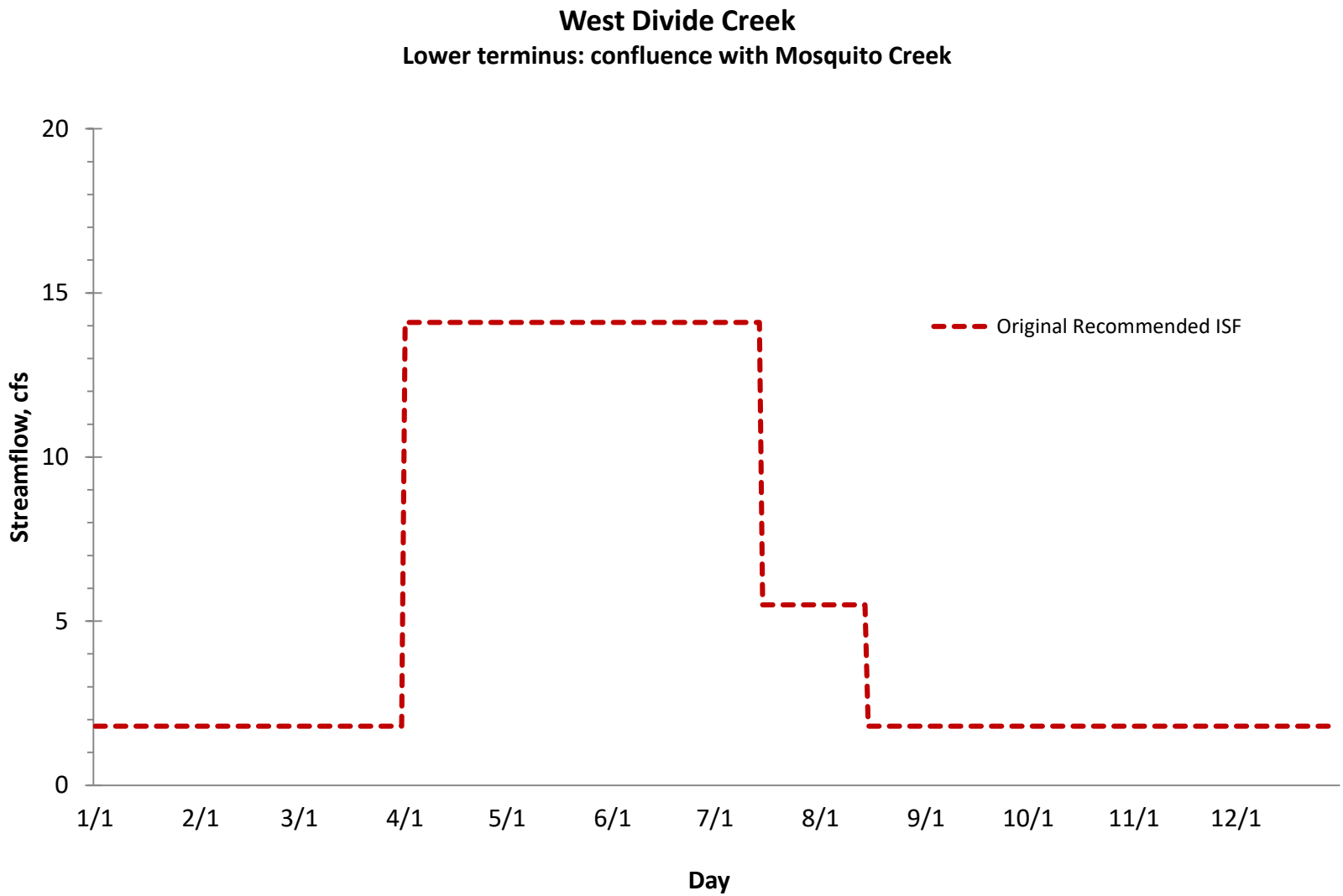

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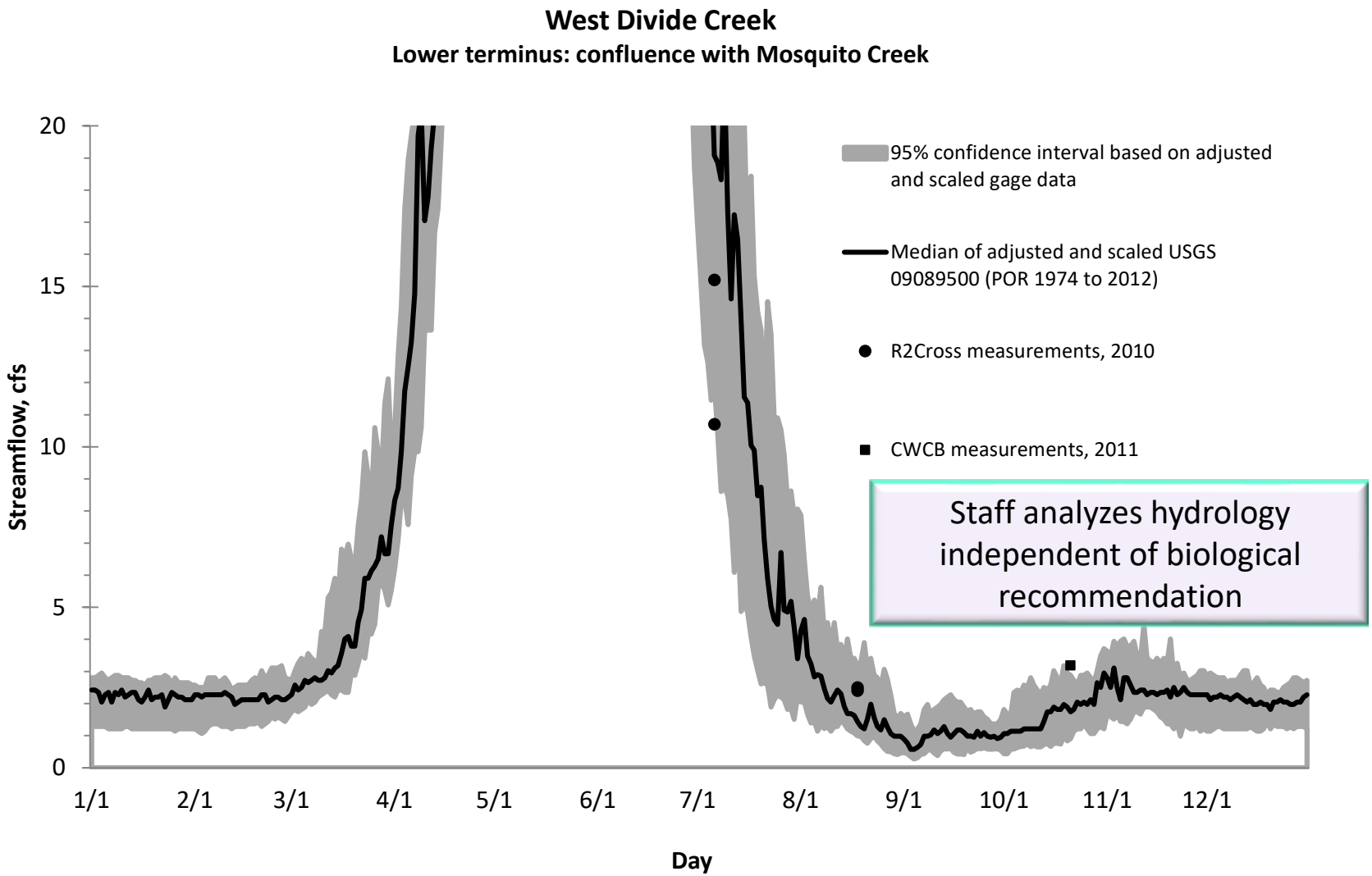
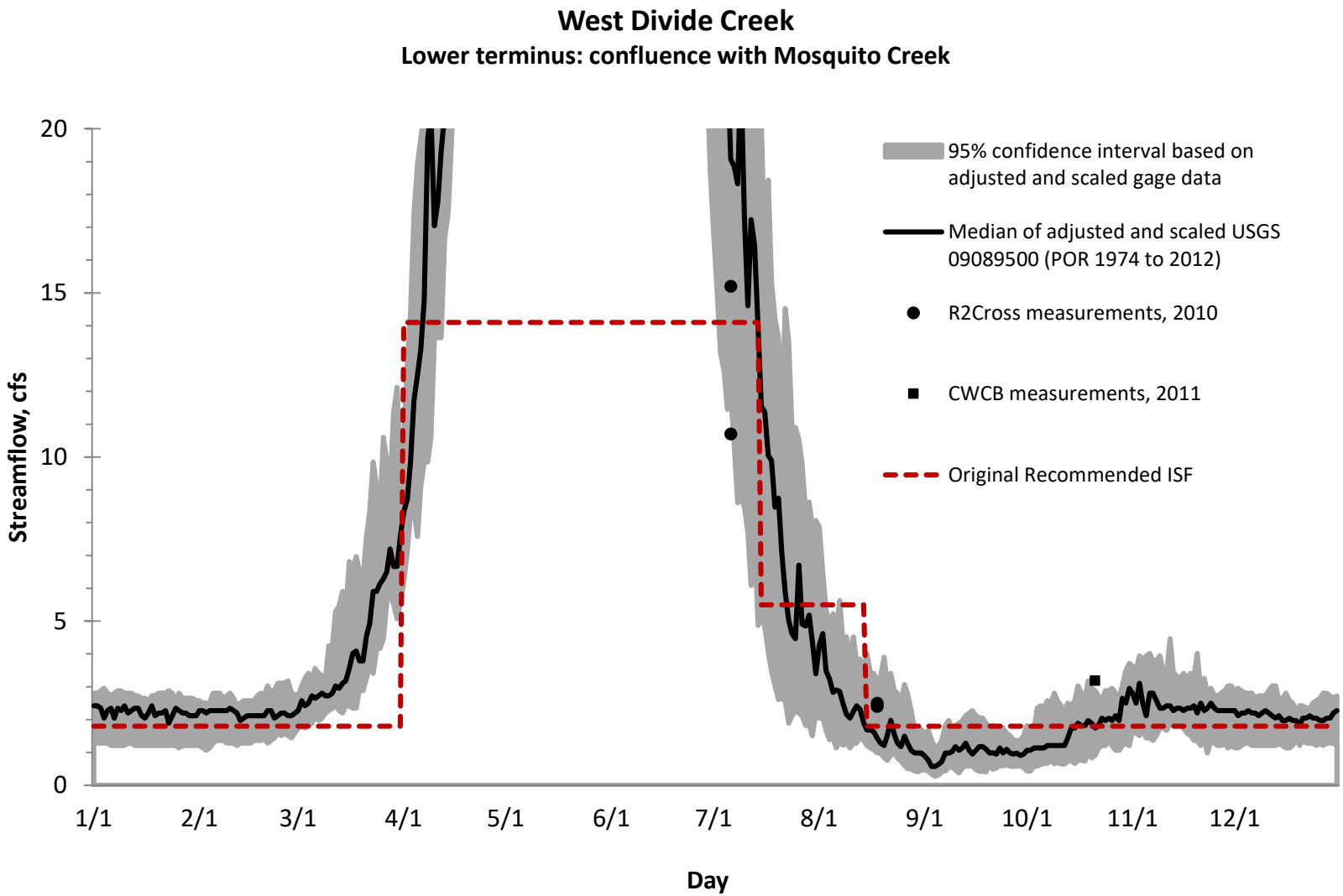


Staff analyzes hydrology independent of biological recommendation

Water Availability



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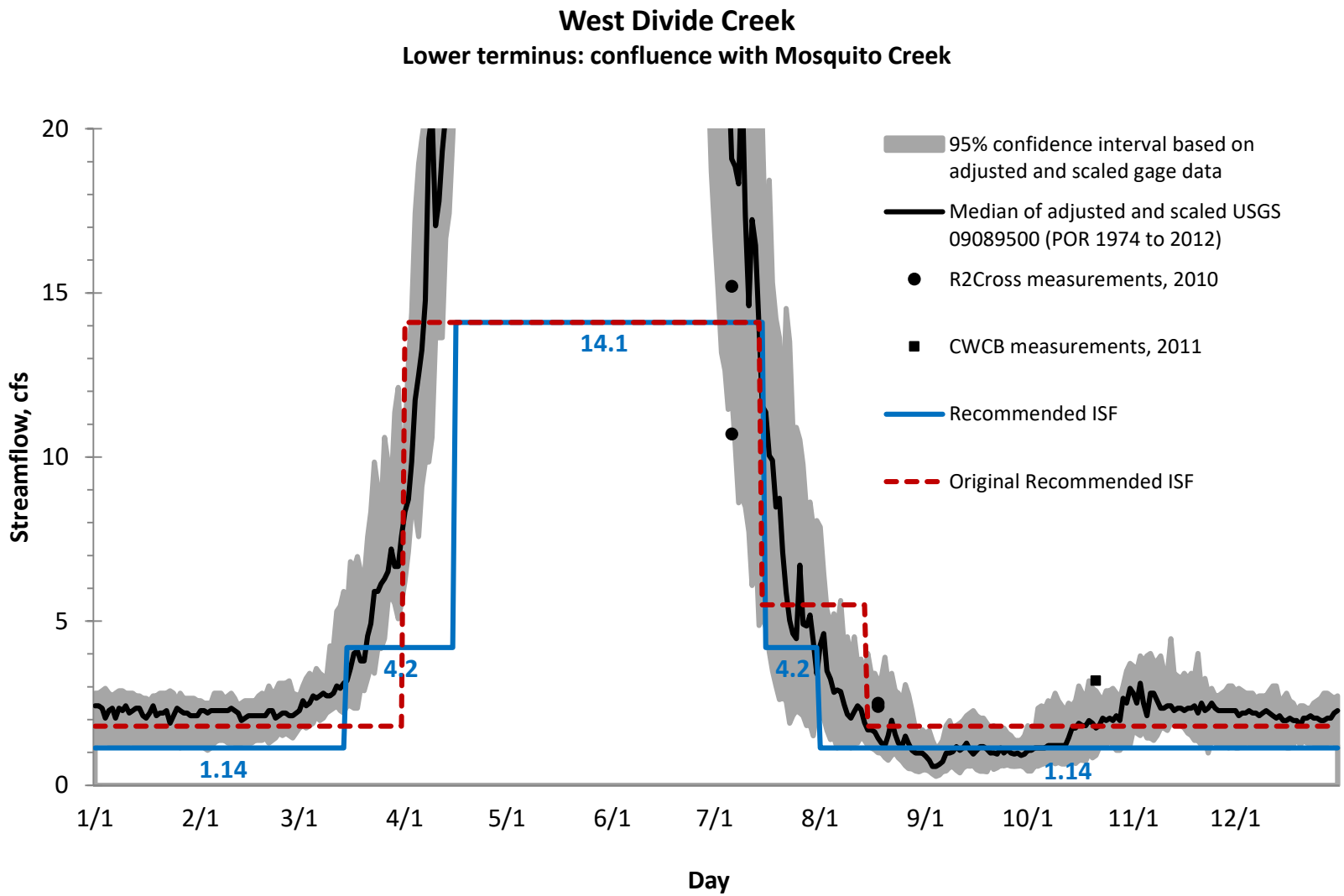
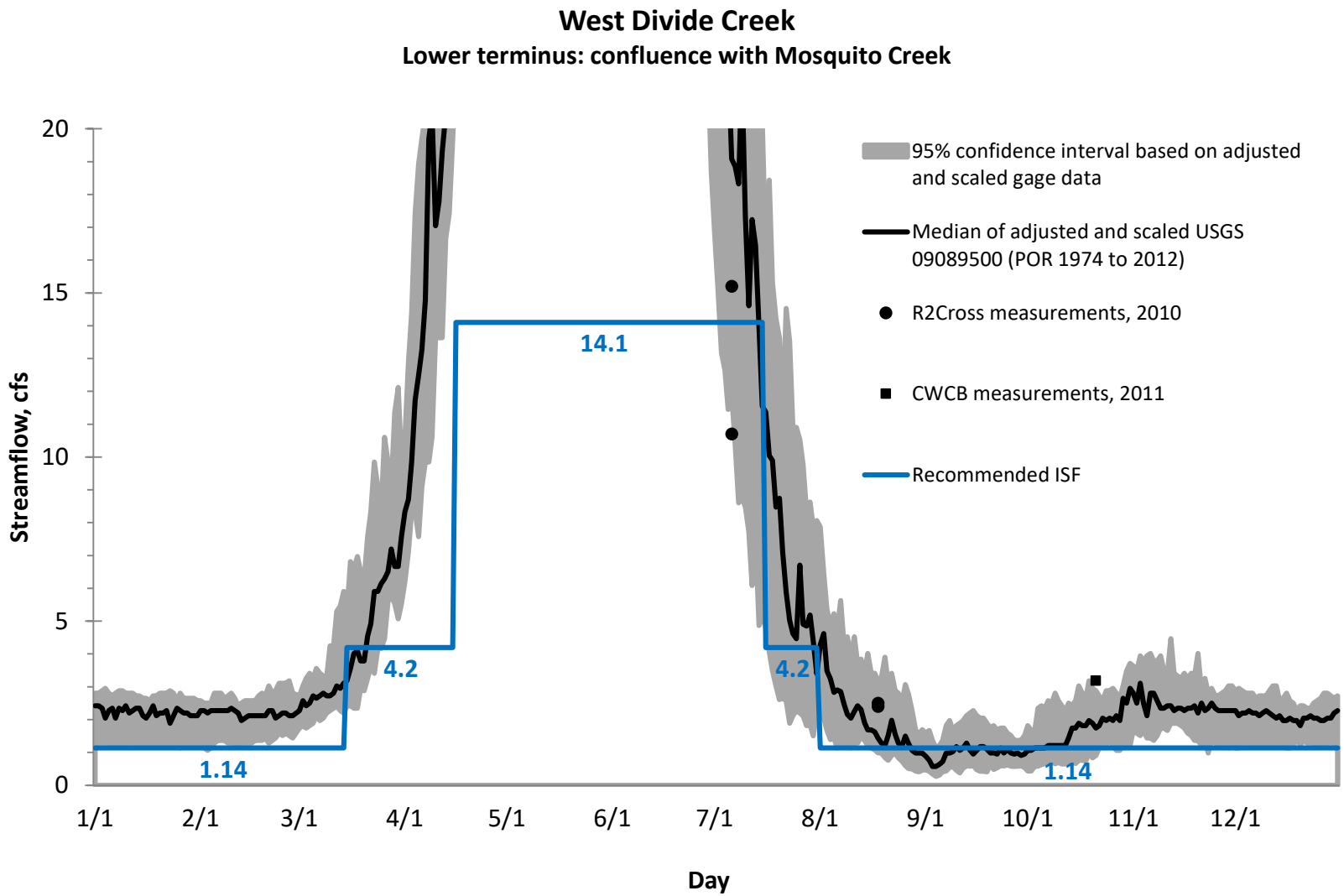


Water Availability

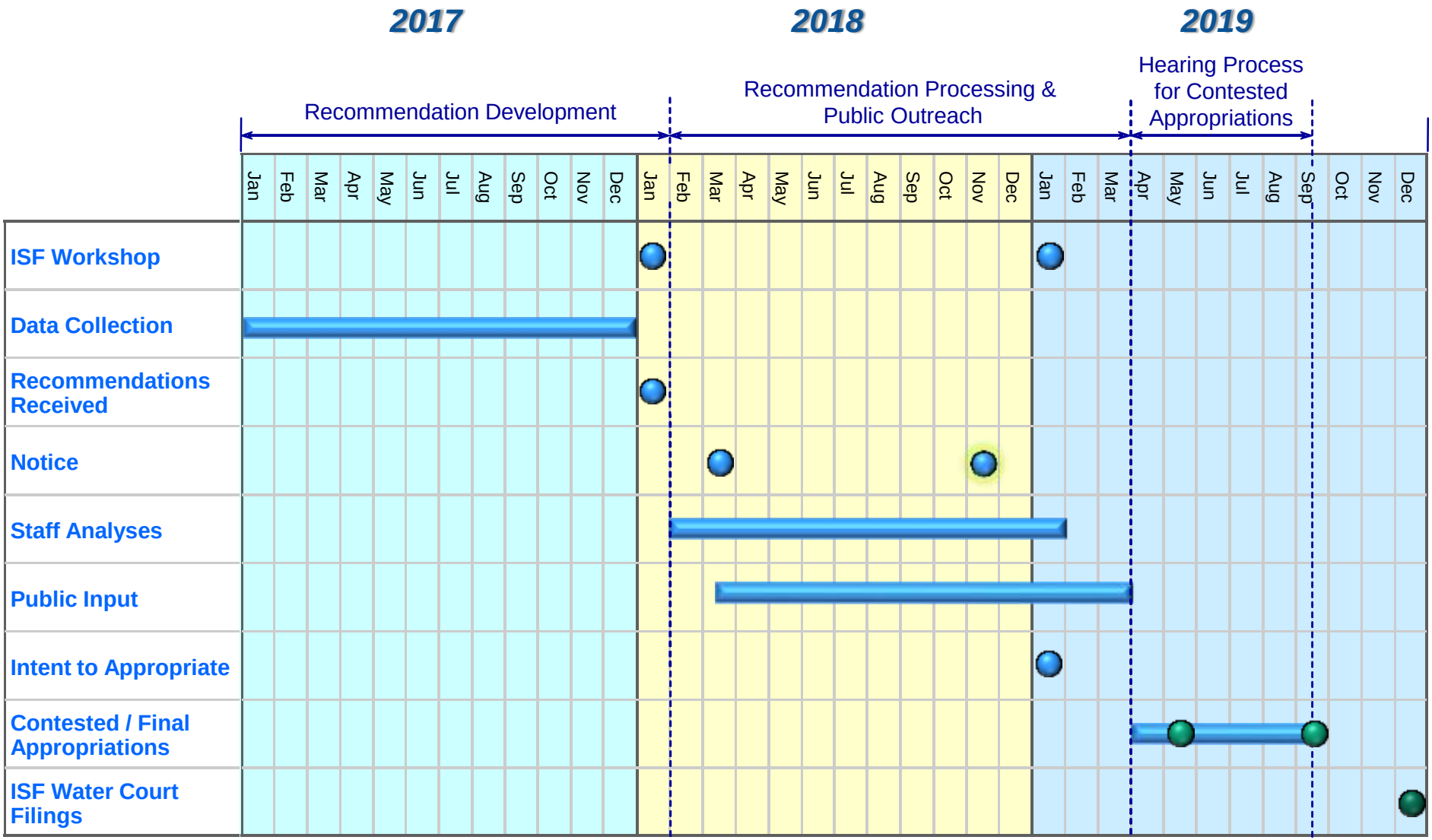


New Appropriation Process

Collect and analyze scientific information related to the required statutory findings and conduct outreach activities with stakeholders so that the Board can declare its intent to appropriate and take final action on the recommendation.

Gold Creek

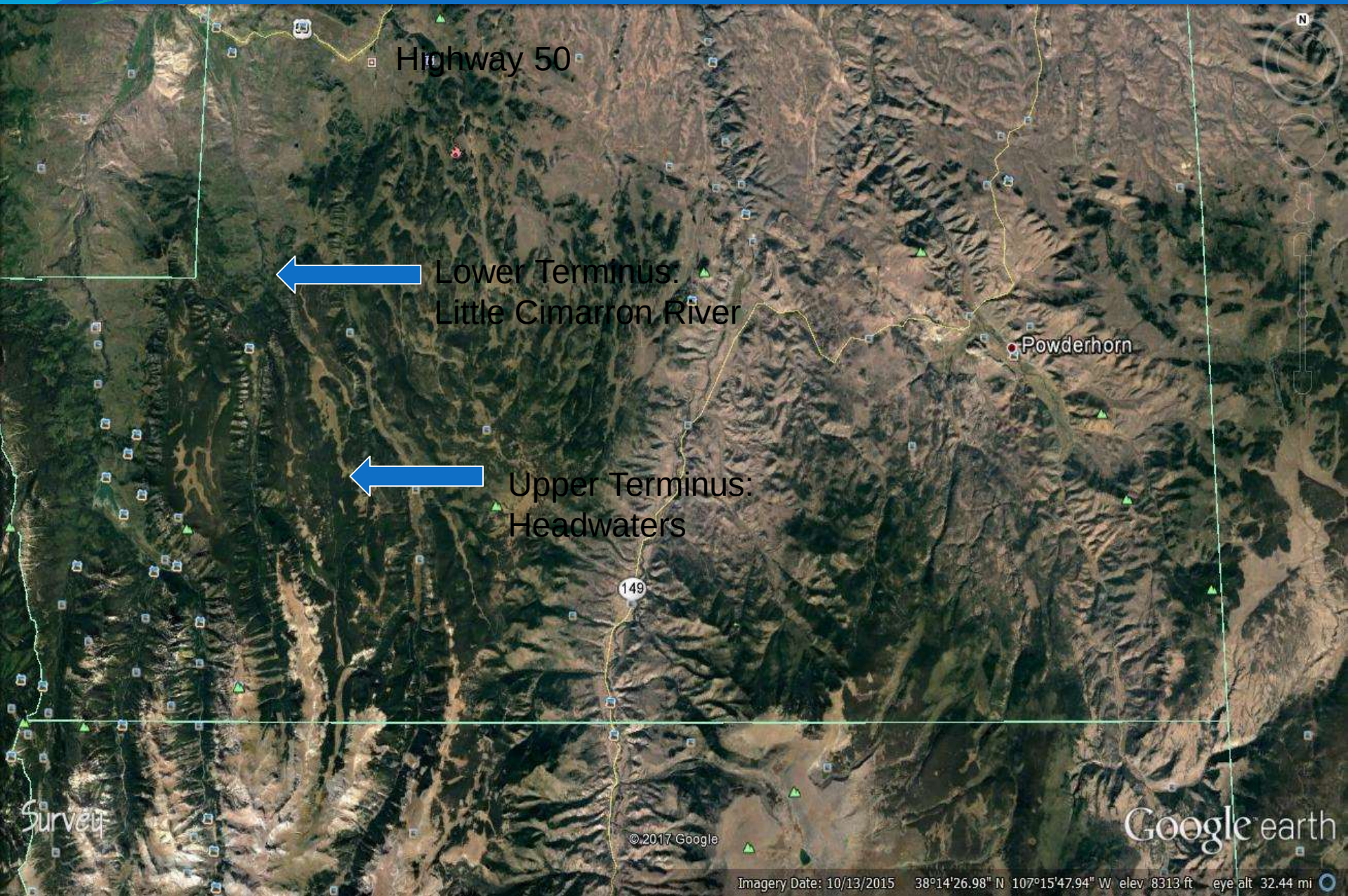
New Appropriation Processing Timeline



East Fork Little Cimarron River

Gunnison County

East Fork Little Cimarron River Location

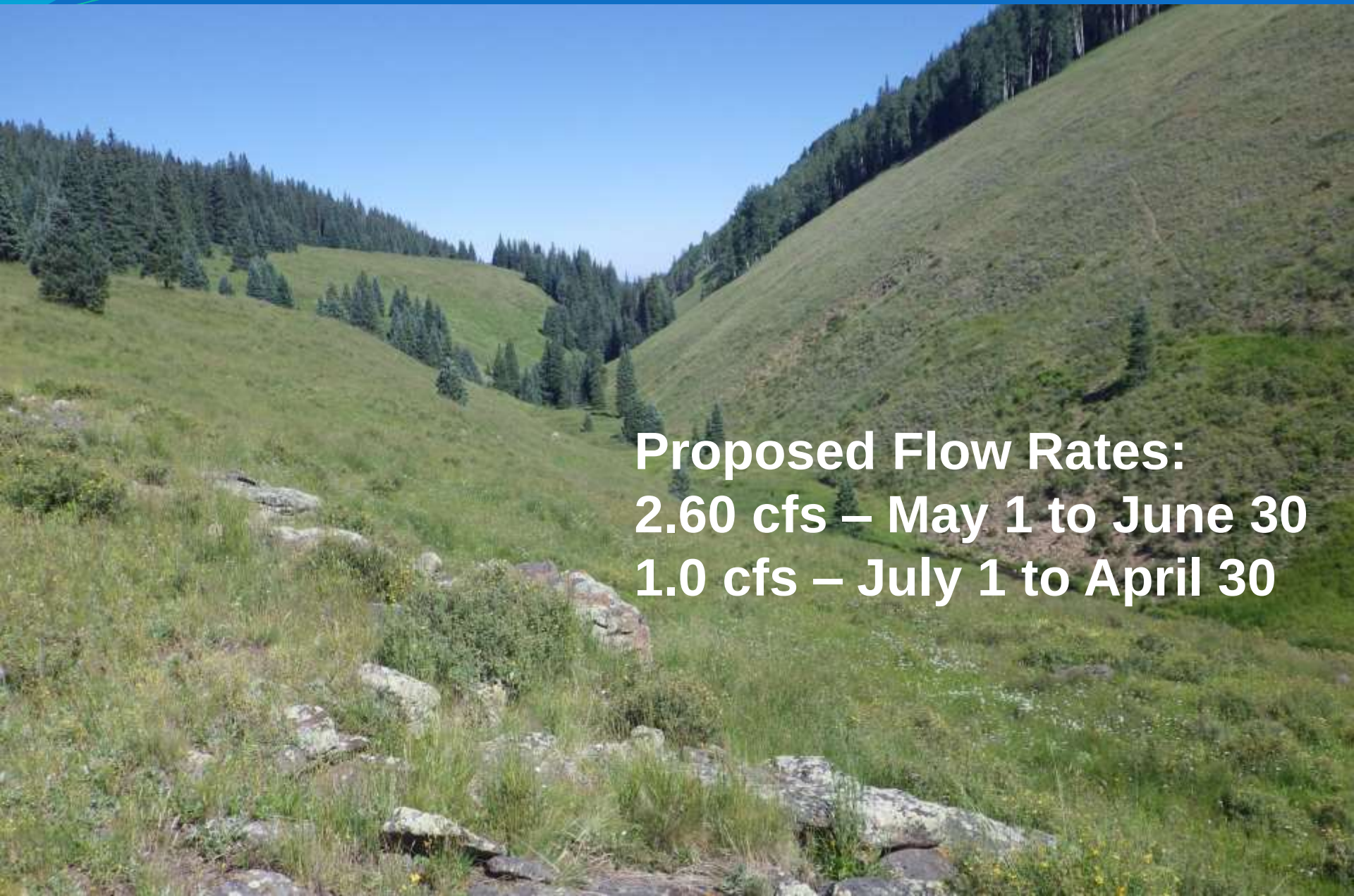


East Fork Little Cimarron River

Natural Environment:

- Fishery: brook trout
- Macros: abundant mayfly, caddisfly, stonefly
- Riparian community: willow, grasses, sedges

East Fork Little Cimarron River



Proposed Flow Rates:
2.60 cfs – May 1 to June 30
1.0 cfs – July 1 to April 30

East Fork Little Cimarron River

Water Availability:

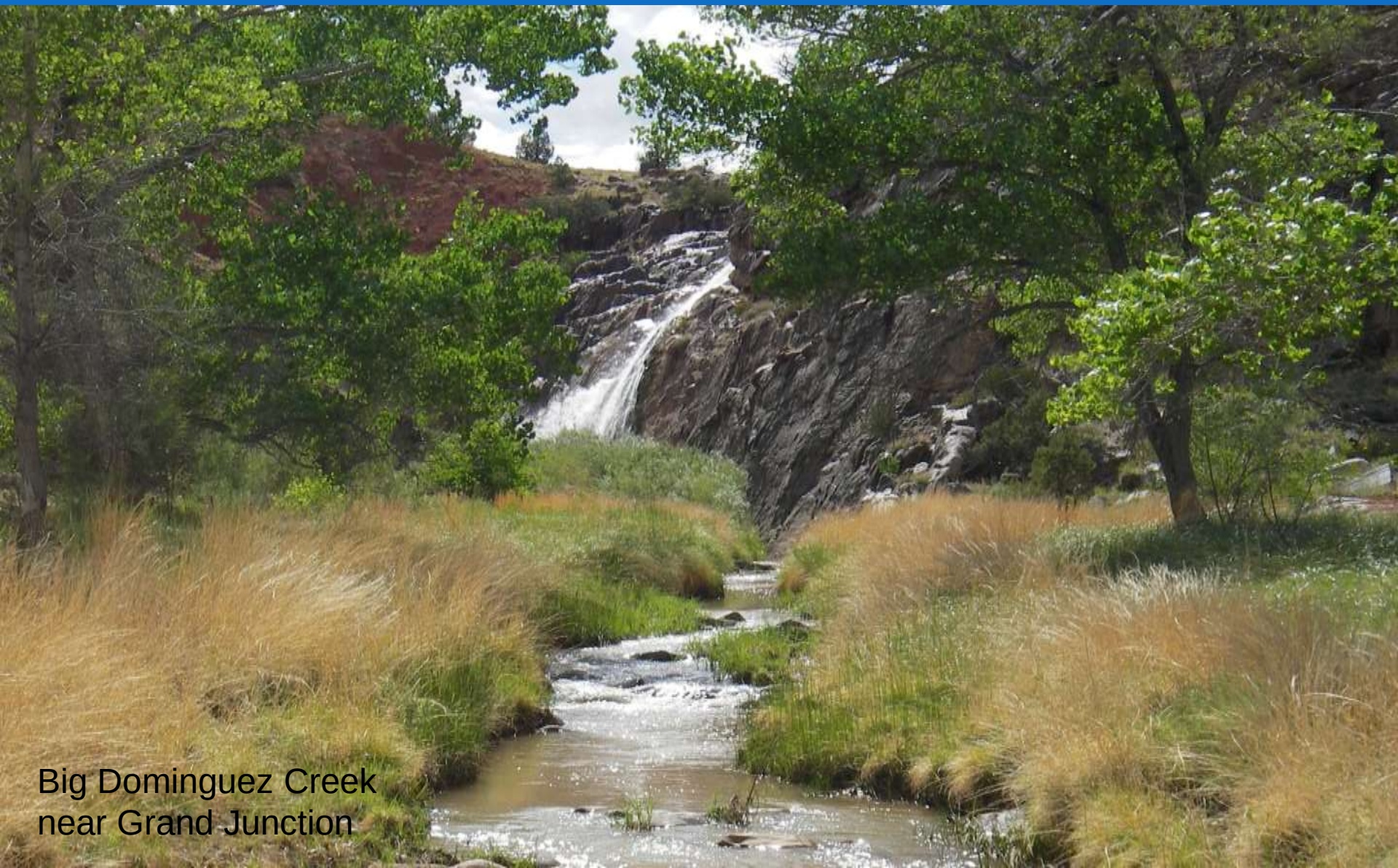
- Snowmelt driven
- At top of watershed
- Gage data is not available

Water Rights:

- None
- However - small on-channel livestock and fish reservoirs

Questions for BLM?

Contact Roy Smith at r20smith@blm.gov or 303-239-3940

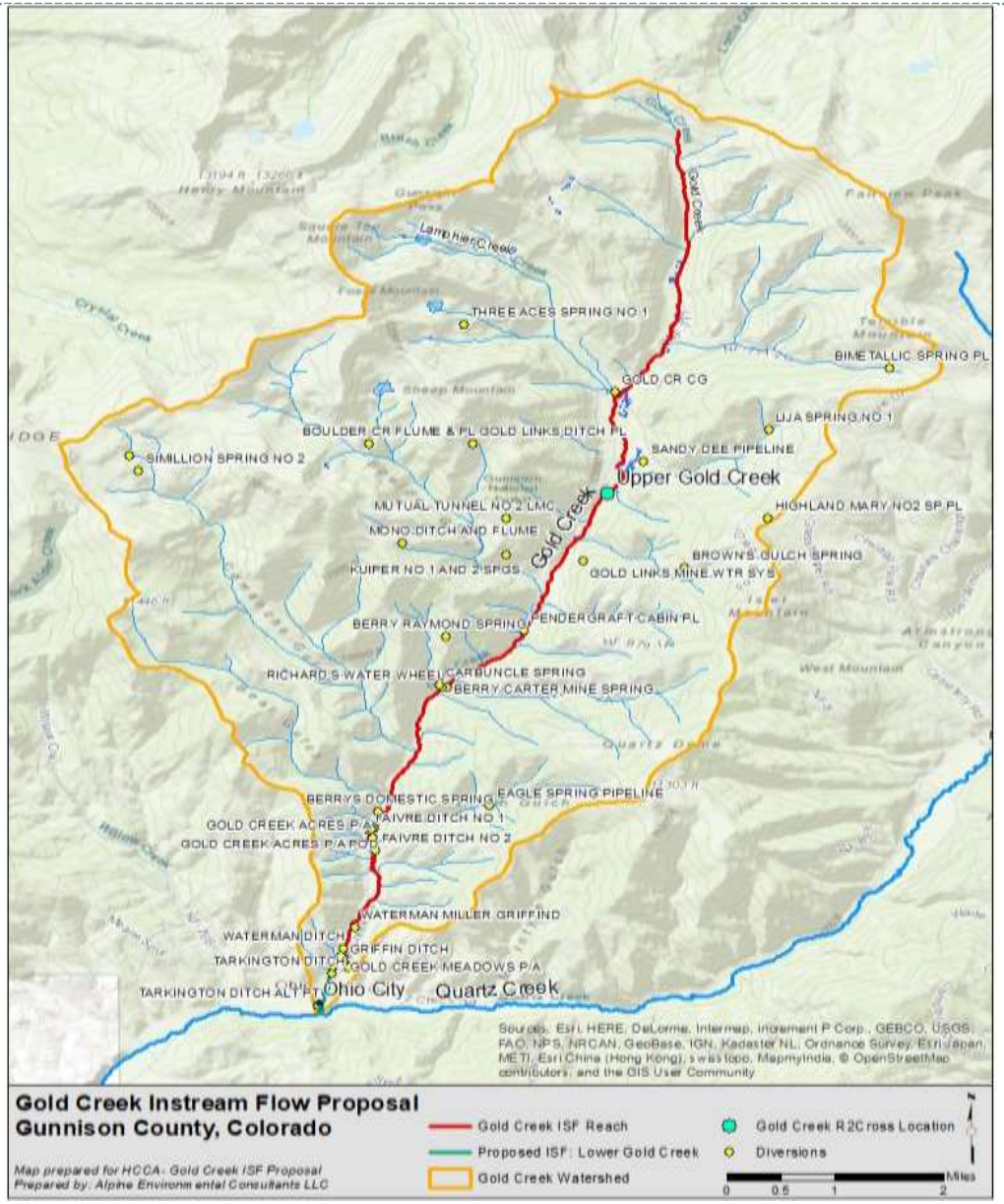


Big Dominguez Creek
near Grand Junction

2018 Instream Flow Proposal

Water Division 4

Gold Creek



Water Availability

Physical

- No gage data available
- Used a combination of StreamStats and R2Cross to look at physical availability

Proposed ISFs

Cross Section (Date)	Measured Discharge (cfs)	Bankfull Top Width[1] (ft)	Winter Flow Recommendation (cfs)	Summer Flow Recommendation (cfs)
Upper Gold Creek (10/4/17)	7.37	36.0	7.0 (no change to existing ISF right)[2]	11.0 (May 1st- July 31st)
Lower Gold Creek (N/A- relied on 10/4 cross section)	-	-	7.0 (Aug. 1st- Apr. 31st)	11.0, based on legal availability (May 1st- July 31st)

Questions?

Julie Nania
Julie@hccacb.org

Colorado Department of Natural Resources

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COLORADO
Water Conservation Board
Department of Natural Resources

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Water Project Loan Program	Instream Flow Program	Colorado Water Plan	Interstate Compacts	CWCB Data Viewer	Board Meetings & Agendas	About the CWCB
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Colorado's Water Plan

Welcome!

The Colorado Water Conservation Board (CWCB) represents each major water basin, Denver and other state agencies in our joint effort to use water wisely and protect our water for future generations.

Next Board Meeting

3/22/2017 9:30 AM — 3/23/2017 5:00 PM

Greeley Guest House
5401 W 9th Street
Greeley, CO 80634

- Notice

CWCB Events

Financing Sustainable Water Workshop - Glenwood Springs	2/28/2017 9:00 AM
Financing Sustainable Water Workshop - Lakewood	3/2/2017 9:00 AM

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Environment

Instream Flow Program
- Instream Flow Appropriations
- Water Acquisitions
- Monitoring & Enforcement
- Ruedi Reservoir Fryingpan River

Climate Change

Watershed Protection & Restoration

Nonconsumptive Needs

Endangered Species

Recreational In-Channel Diversions

Salinity Control

Wild & Scenic Rivers Fund

Questions?
Rob Viehl

2019 Proposed Instream Flow and Natural Lake Level Appropriations

Pursuant to ISF Rule 5, the Colorado Water Conservation Board is providing notice that the following streams and lakes are being considered for appropriation. The earliest these streams could be recommended to the CWCB Board is at the January 2019 meeting. Staff is evaluating these recommendations for completeness and accuracy and performing an independent review of water availability. Staff requests public comment on these recommendations and urges any interested parties to provide comments to Rob Viehl. Detailed information regarding these proposed instream flow appropriations can be obtained by clicking on the stakeholder recommendation in the table below. Staff will provide regular updates to this table as information is received and developed.

Appropriation Notices

- March 2018

Presentations at the 2018 ISF Workshop

- CWCB Staff
- BLM 2019 Instream Flow Recommendations
- CPW 2019 Instream Flow Recommendations
- High Country Conservation Advocates 2019 Instream Flow Recommendations

Google Earth
View the January 2019 Recommendations in Google Earth.

Last Updated: September 6, 2018
Instream Flow Appropriations

WATER DIVISION	STREAM NAME	STAFF ANALYSIS & RECOMMENDATION	STAKEHOLDER RECOMMENDATION	COUNTY	STATUS
1	Coal Creek *(Boulder County Open Space Boundary to Louisville Wastewater Treatment outfall)*		City of Louisville & CPW	Boulder	Active Stakeholder Letters
1	Coal Creek *(Louisville Wastewater Treatment outfall to*		City of Louisville & CPW	Boulder	Active Stakeholder Letters

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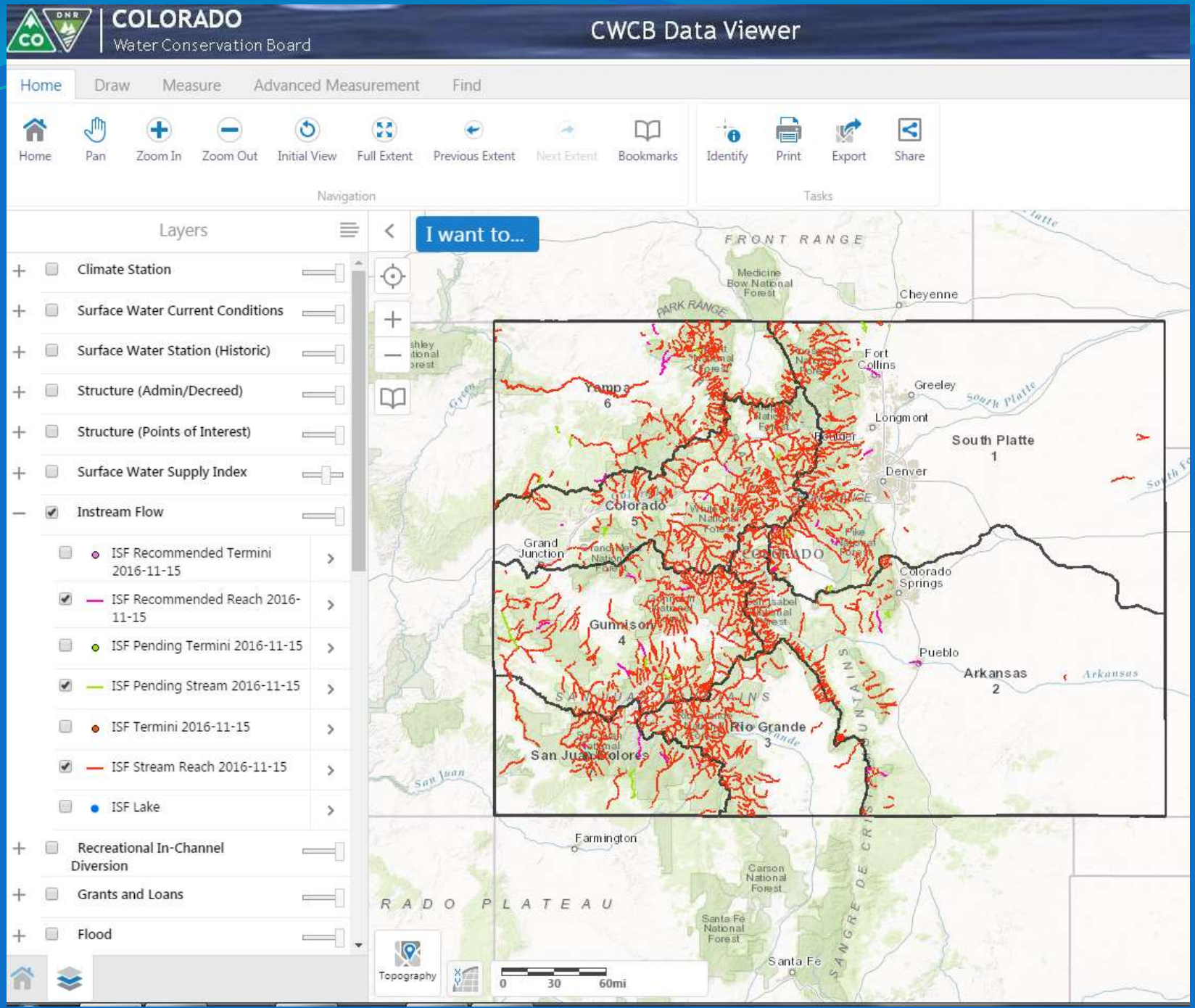
Financing Sustainable Water Workshop - Glenwood Springs	2/28/2017 9:00 AM
Financing Sustainable Water Workshop - Lakewood	3/2/2017 9:00 AM


COLORADO
Water Conservation Board
CWCB Data Viewer
Home
Draw
Measure
Advanced Measurement
Find
Home
Pan
Zoom In
Zoom Out
Initial View
Full Extent
Previous Extent
Next Extent
Bookmarks
Navigation
Identify
Print
Export
Share
Tasks
Layers
I want to...
Climate Station
Surface Water Current Conditions
Surface Water Station (Historic)
Structure (Admin/Decreed)
Structure (Points of Interest)
Surface Water Supply Index
Instream Flow
ISF Recommended Termini 2016-11-15
ISF Recommended Reach 2016-11-15
ISF Pending Termini 2016-11-15
ISF Pending Stream 2016-11-15
ISF Termini 2016-11-15
ISF Stream Reach 2016-11-15
ISF Lake
Recreational In-Channel Diversion
Grants and Loans
Flood
FRONT RANGE
Cheyenne
Fort Collins
Greeley
Longmont
Boulder
Denver
South Platte
1
Yampa
6
Colorado
5
Grand Junction
Colorado Springs
Gunnison
4
Pueblo
Arkansas
2
Rio Grande
3
San Juan-Dolores
Farmington
Santa Fe
Topography
0
30
60mi

Questions ?