



Upper Dolores River Stream Protection Working Group

Task Team Work Session 1 15 May 2019

Task Team Members

- ▶ Mary Hammer, SJNFS
- ▶ Garrett Hanks, NTU
- ▶ Clay Kampf, SJNFS
- ▶ Anthony Madrid, SJNFS
- ▶ Kelly A Palmer, SJNFS
- ▶ Mike Preston/Ken Curtis, DWCD
- ▶ Duncan Rose, DRA (TU chapter)
- ▶ Jim White, CPW

Today's Discussion Guide

▶ **Session I**

- ▶ **Review Discussion Guide, introductions, quick review of charge to Task Team**
- ▶ **Setting the Stage: “Structure, Process, Substance”**
 - ▶ *Structure – envisioning a product - what is our “Deliverable”?*
 - ▶ *Process – how will we achieve the Deliverable?*
 - ▶ *Substance – what is in the Deliverable?*
- ▶ **Testing/Applying the Process**
 - ▶ Procedural final-resolution: a “vulnerability/resilience” and “priority order” based “working draft” proposal presented for consideration (Jim/Clay/Garrett/Duncan)
 - ▶ Finalize which streams are in the Test Group
 - ▶ Apply and test the match-stream-to-best-protection-tool(s) process to the Test Group
- ▶ **Offline: Write-up, circulate, rework, submit to Task Team, refine, approve**
- ▶ **Session 2(+) Development/finalization of Implementation Work Plan as needed (TBD)**
- ▶ **Submit to Working Group for consideration**

Our Charge (For Initial Discussion)

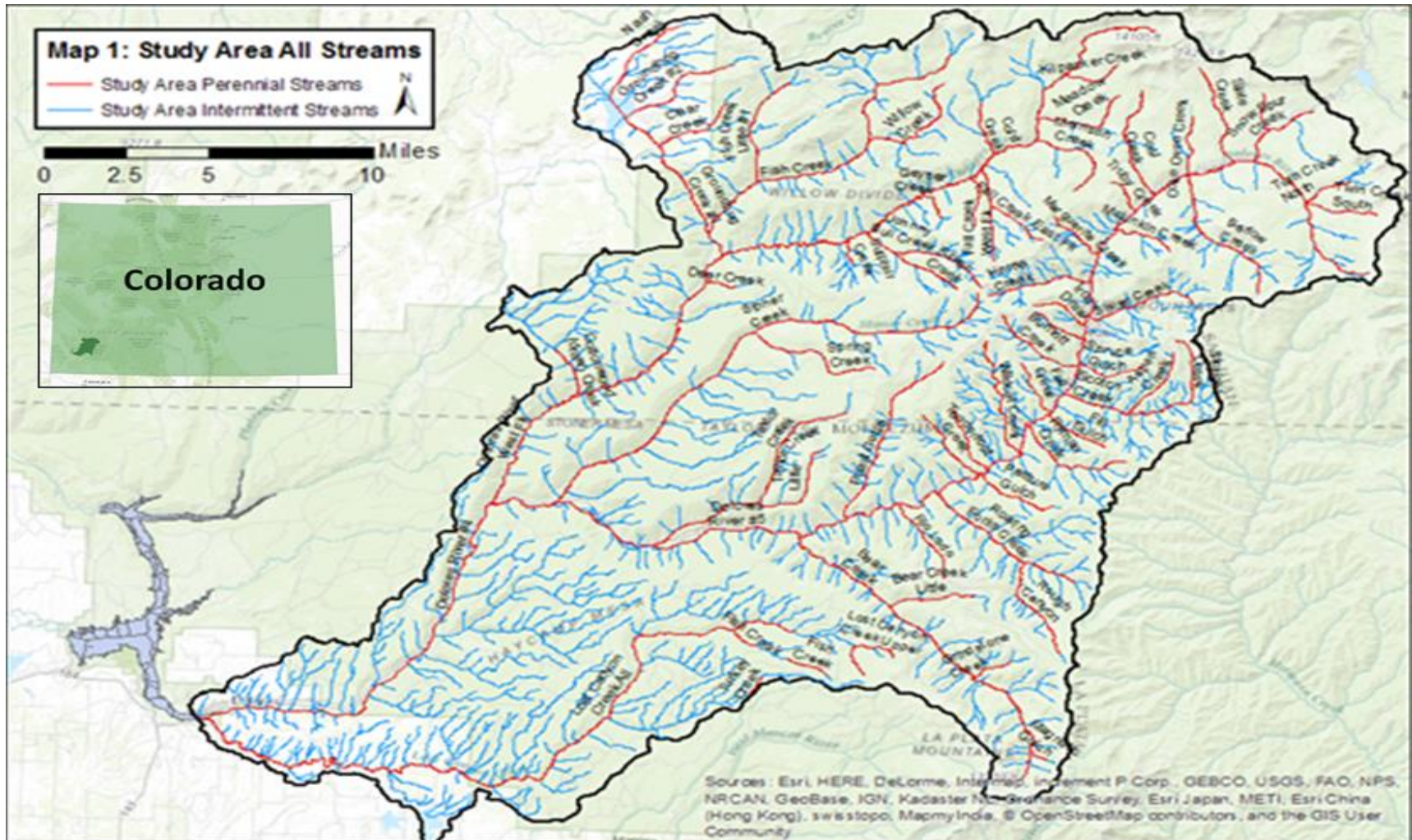
▶ **Core Questions**

- ▶ What trout streams in the Upper Dolores watershed (Study Area or SA) are most threatened by (which?) forces/disturbances (present and foreseeable future)?
- ▶ What additional protections, if any, for each stream, selected from a range of options, are best suited to mitigate those forces?

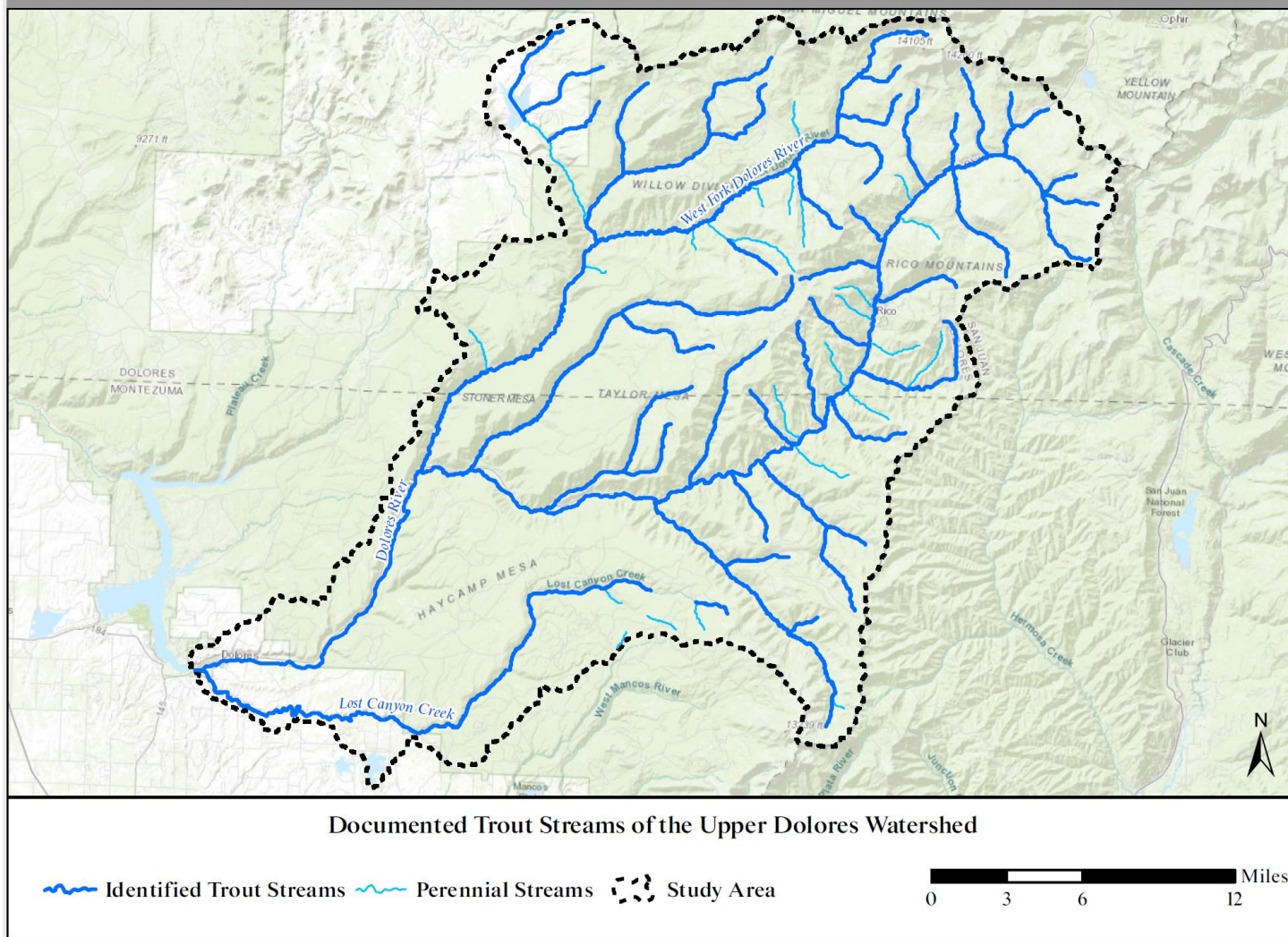
▶ **Anticipated Product**

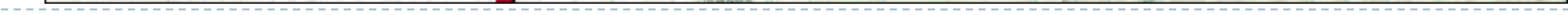
- ▶ Primary deliverable: a table, with concise documentary text, that reflects for each of the estimated 44 targeted streams in the SA the following:
 - ▶ 1) a prioritized categorization by vulnerability profile to each of the current or potential disturbances noted above and
 - ▶ 2) an identification of the most feasible adaptive-management – based protection strategy (and general tactics) associated with that stream.

Our Study Area (“SA”)



Our Trout Streams





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Setting the Stage: “Structure, Process, Substance”

- ▶ Structure – envisioning a product - what is our “Deliverable”?
- ▶ A set of concise, table/bullet formatted, map-based recommendations for each stream in a test/prototype set of streams (6 to 8 streams)?
 - ▶ By stream name:
 - Recommended protection strategy tool *candidates* for that stream (may be several tools)
 - Who has lead for each tool for that stream?
 - General implementation timeframe?
- ▶ Present to UDSP full Working Group for consideration

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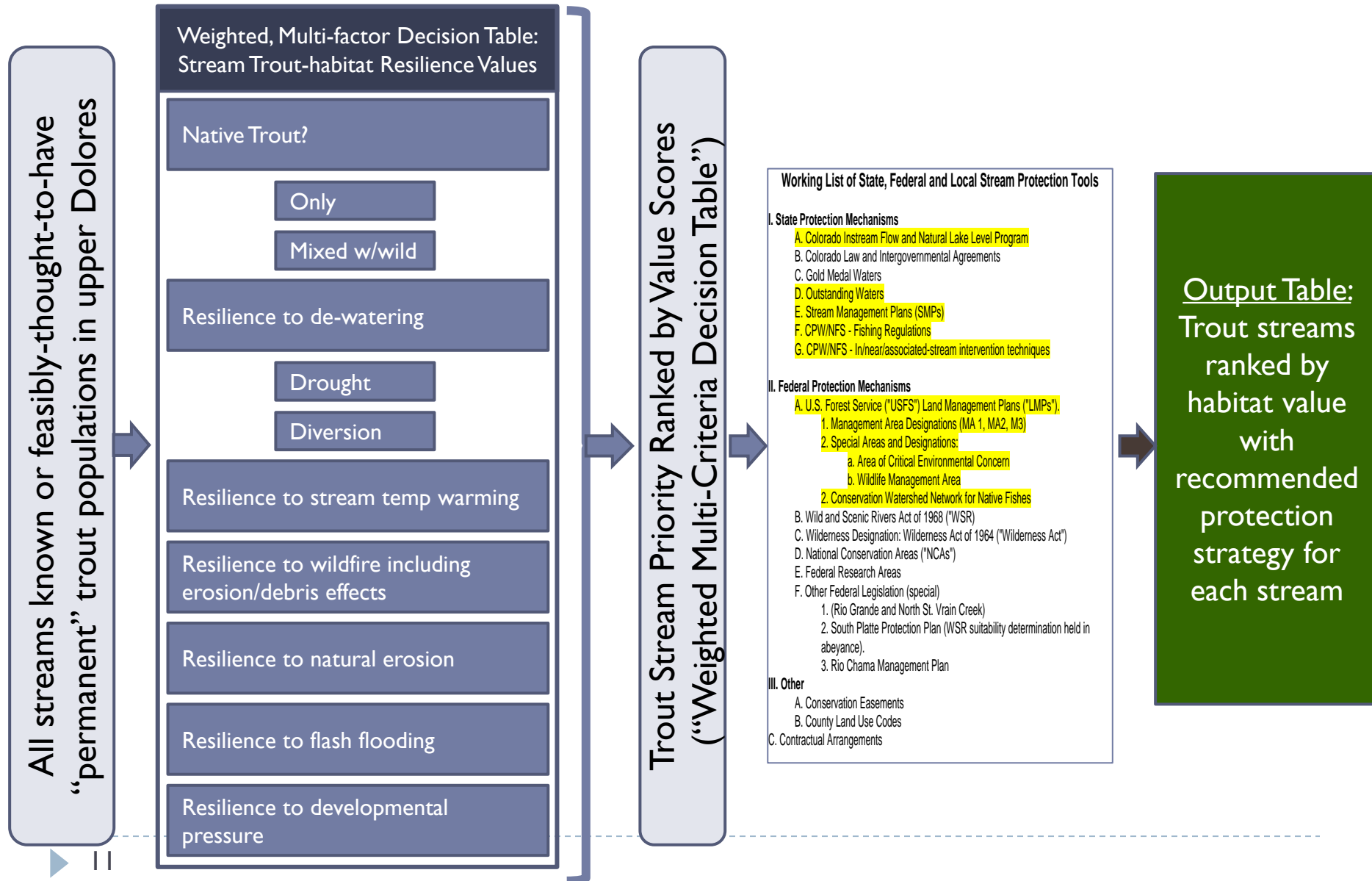
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Upper Dolores Stream Protection General Process



Setting the Stage: “Structure, **Process**, Substance”

- ▶ Process – setting the stage for how we will achieve Deliverable
 - ▶ **Which streams are to be included by the end of the full project?**
 - ▶ All cutthroat streams in Study Area (SA)?
 - ▶ All trout streams in SA?
 - ▶ **Protected from what disturbances?**
 - ▶ Dewatering (natural, human)
 - ▶ Stream temperature increase
 - ▶ Wildfire including triggered sedimentation/debris flow
 - Non-wildfire induced erosion, sedimentation
 - Flash flooding wash-out
 - Land activity/development? Over-fishing, Other?
 - ▶ **What is on the cafeteria-line of available stream protection tools/techniques?**
(briefly review protection tools overview document)
 - ▶ **How do we match each stream to its most appropriate protection tool(s)?**
 - ▶ Vulnerability, priority aspects
 - DRA low-flow vulnerability list/temp map? Multi-weighted-criteria table?
 - Temperature monitoring findings, wildfire modeling, flash flood vulnerability?
 - “Green lineage” first, then Colorado River CT, then all remaining cutthroat streams, then rest of trout streams?
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 - ▶ All cutthroat? CRT?, Green lineage? “DRA Strongholds”? Ranked by disturbance resistance/resilience? Ranked by “Eco/Community Value”?
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Working List of State, Federal and Local Stream Protection Tools

▶ **I. State Protection Mechanisms**

- ▶ **A. Colorado Instream Flow Program**
- ▶ B. Colorado Law and Intergovernmental Agreements
- ▶ C. Gold Medal Waters
- ▶ **D. Outstanding Waters**
- ▶ **E. Stream Management Plans (SMPs)**
- ▶ **F. CPW/NFS - Fishing Regulations**
- ▶ **G. CPW/NFS - In/near/associated-stream intervention techniques**

▶ **II. Federal Protection Mechanisms**

- ▶ **A. U.S. Forest Service ("USFS") Land Management Plans ("LMPs").**
 - ▶ **1. Management Area Designations (MA 1, MA2, M3)**
 - ▶ **2. Special Areas and Designations:**
 - ▶ **a. Area of Critical Environmental Concern**
 - ▶ **b. Wildlife Management Area**
 - ▶ **2. Conservation Watershed Network for Native Fishes**

- ▶ **B. Wild and Scenic Rivers Act of 1968 ("WSR")**
- ▶ **C. Wilderness Designation: Wilderness Act of 1964 ("Wilderness Act")**
- ▶ **D. National Conservation Areas ("NCAs")**
- ▶ **E. Federal Research Areas**
- ▶ **F. Other Federal Legislation (special)**
 - ▶ **1. (Rio Grande and North St. Vrain Creek)**
 - ▶ **2. South Platte Protection Plan (WSR suitability determination held in abeyance).**
 - ▶ **3. Rio Chama Management Plan**

▶ **III. Local/Other**

- ▶ **A. Conservation Easements**
- ▶ **B. County Land Use Codes**
- ▶ **C. Contractual Arrangements**

Key Aspects of all Candidate Tools

1. Getting the protection in place

- ▶ Who can initiate? How?
- ▶ What is the initiation process? How long?
- ▶ What/where is the authority to approve?

2. Managing the protection once it is in place

- ▶ Who/how is it managed if approved?

3. Enforcing the protection

- ▶ Who enforces and how?
- ▶ For each tool we are asking:

“In what circumstances is this tool most relevant?”

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DWR Map Viewers

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For help using our data viewers, please see the FAQ Videos at the bottom of this page or visit [CDWR's YouTube Channel](#).

Well Permit Research Viewer: For use in researching and locating well permits. Search for wells by...permit number, address, applicant name, PLSS description, UTM coordinates, Latitude/Longitude. Useful for realtors, change of ownership applicants and general well research. (Denver Basin Mylars, Atlases and Historical Photos are located under the Layer Catalog button.)
[Launch Well Permit Research Viewer](#)

Full Map Viewer: All inclusive map viewer with over 170 map layers of DWR and CWCBC data. (Denver Basin Mylars, Atlases and Historical Photos are located under the Layer Catalog button.)
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Layer List Information by Viewer: To view what datasets are in each viewer, use the link below to view a Google sheet that lists datasets by viewer.
[View Layer List](#)

FAQ Sheet: To view frequently asked questions and answers about Map Viewer functionality, use the link below.
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FAQ Videos

Colorado Decision Support System

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CDSS
Colorado's Decision Support System

Map Viewer

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Navigation

Layers

- PLSS
- ☒ Admin Boundary
- Denver Basin Aquifer
- Designated Basin
- Management District
- Water Division
- Water District
- ☒ County
- City
- Public Land
- State Trust Land
- Water Conservation District
- Water Conservancy District

Quick Tools

Basemaps

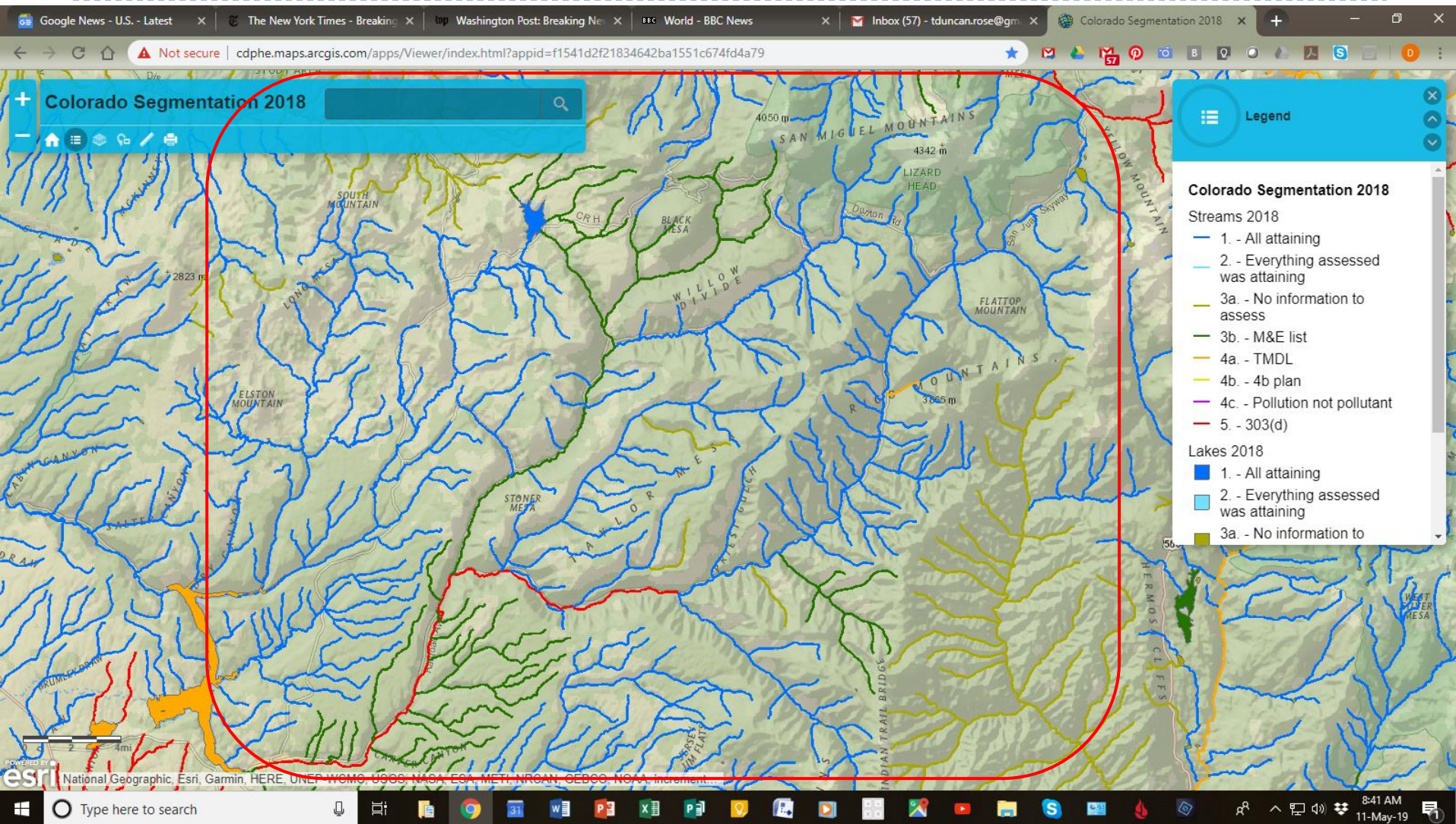
UTM Zone 13, NAD83 X 172492.4615 Y 4147851.5308 Scale 1: 577,791 Go 0 3 6mi

min, Intermap, increment P. Corp., GEBCO, USGS, FAO, NPS, NRCAN, Ge

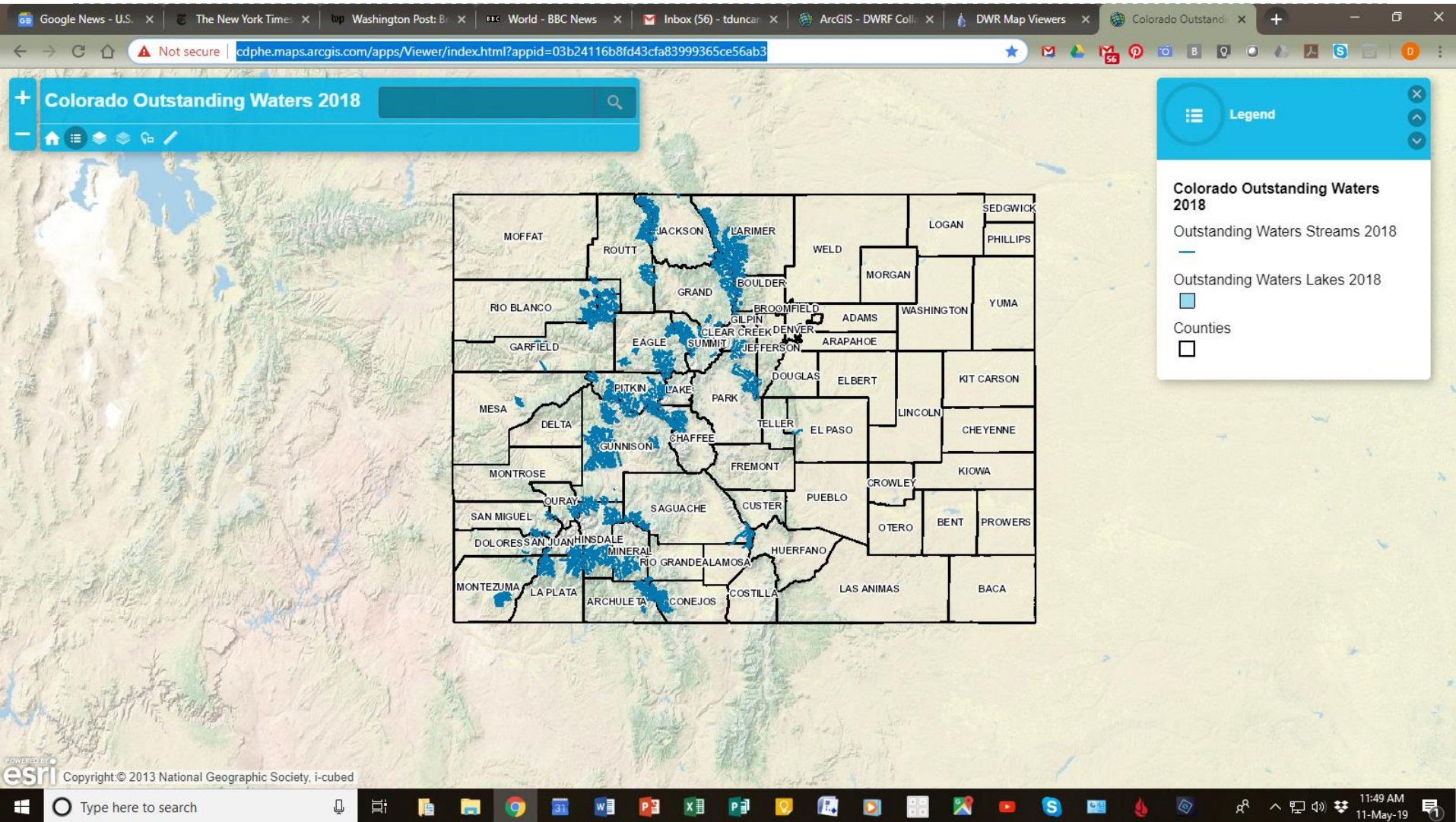
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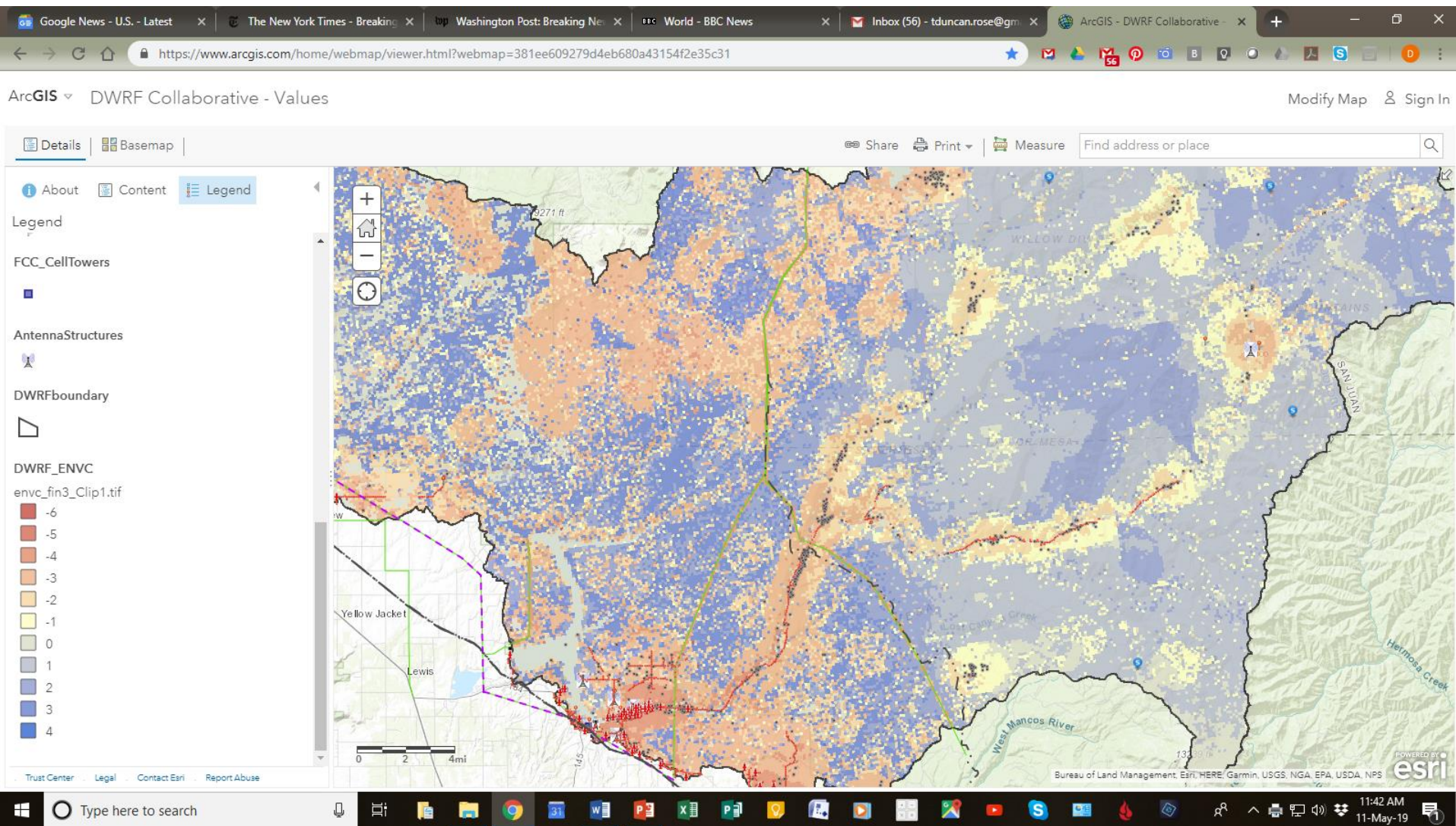
CDPHE Stream Segmentation Map



Colorado Outstanding Waters 2018



SJNF/BLM/DWRF Wildfire Risk Maps



22

<https://www.arcgis.com/home/webmap/viewer.html?webmap=381ee609279d4eb680a43154f2e35c31>

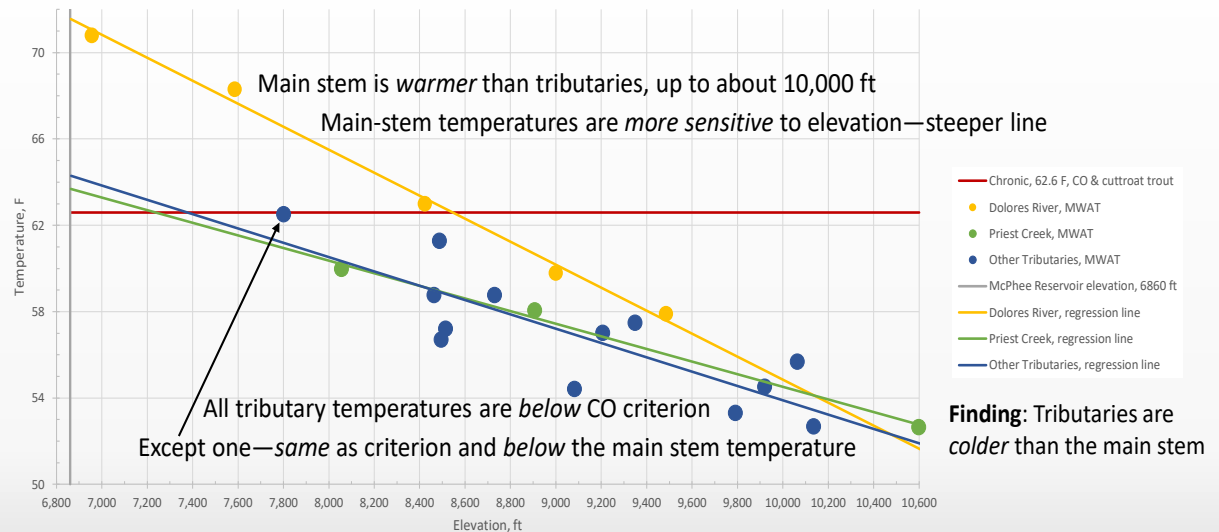
DRA Docs/Data

- ▶ Climate Change Vulnerability Study
- ▶ Stream Temperature Analysis

Table 8.1: Ranking of Existing Trout Streams in Study Area by Long-Term Vulnerability to Climate Change (Low to High)

OBJECT ID	STREAM NAME	Quintile	Composite Score	Stream Length Miles	Watershed Size Sq Miles	M7D10Y Low Flow	Mean Annual Precip	Mean Basin Elevation	Mean Basin Wall Slope	% Area watershed above 7500ft	Elevation of Stream Mouth	Headwtr elevation	Average Gradient	Miles by Category
Quintile 1: Lowest Vulnerability														
142	East Fork Dolores River	1	11	6.35	1	1	1	1	2	1	1	1	2	
82	Barlow Creek	1	15	5.53	2	1	1	1	3	1	2	2	2	
87	Coal Creek	1												
16	Slate Creek	1												
127	Snow Spur Creek	1												
125	Silver Creek (above Rico pond)	1												
139	Twin Creek North	1												
83	Bear Creek	1												
101	Fish Creek @ SWA	1												
Quintile 2: Lower Vulnerability														
93	Dolores River West Fk	2												
15	Lizard Head Creek	2												
116	Meadow Creek	2												
130	Stoner Creek	2												
23	Twin Creek South	2												
117	Morrison Creek	2												
121	Roaring Forks Creek	2												
122	Rough Canyon	2												
98	Fall Creek East Fk	2												
108	Horse Creek	2												
113	Lost Canyon (above Dipping Vat Creek)	2												
92	Upper Dolores (#5)	2												
Quintile 3: Moderate Vulnerability														
88	Coke Oven Creek	3												
96	Fall Creek (Dunton)	3												
102	Fish Creek Little (#1)	3												
111	Kilpacker Creek	3												
1	Nash Creek	3												
128	Spring Creek	3												
107	Upper Groundhog Creek (#2)	3												
141	Willow Creek	3												
Quintile 4: Higher Vulnerability														
124	Scotch Creek	4												
131	Straight Creek	4												
91	Lower Dolores (#4)	4												
134	Taylor Creek	4												
105	Grindstone Creek	4												
119	Priest Gulch	4												
84	Bear Creek Little	4												
85	Burnett Creek	4												
17	Marguerite Creek	4												
Quintile 5: Highest Vulnerability														
112	Lost Canyon Creek (All)	5												
18	Silver Creek (Johnny Bull)	5												
140	Wildcat Creek	5												
123	Ryman Creek	5												
86	Clear Creek	5												
135	Taylor Creek Little	5												
120	Rio Lado	5												
136	Tenderfoot Creek	5												
Total Miles														

Observations from data, July-August 2018



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1. ★ State of **water rights/appropriation** in the Upper Dolores – room to maneuver?
 - Mike Preston, GM & Ken Curtis, Chief of Engineering & Construction, DWCD; Doug Pickering, PG, Water Commissioner Districts 71 & 69
2. ★ **In-Stream Flow Appropriation** – current coverage, procedure, politics, Duncan Rose, DRA/Garrett Hanks, National TU
3. ★ **Outstanding Waters designation** – what is it, how to do, what level of protection does it provide? Garrett Hanks, National TU/Duncan Rose, DRA
4. ★ **Stream Management Plans** – Duncan/Garrett, What are they? Relevant?
5. ★ **CPW/SJNFS tools**, Jim White, CPW, Clay Kampf, SJNFS
 - Regulatory tool kit (catch & release, single hook, stream closing/rotation, etc.)
 - In/near/associated-stream intervention – how are CPW/SJNFS work-plans determined? What are current plans?
6. ★ Current **SJNFS Dolores LMP**, Kelly Palmer, SJNFS; alternative variations/examples Garrett Hanks, NTU
7. ★ **Other Federal devices** - Relevant? Necessary? Feasible?

STREAM NAME	DRA Quintile**	Trout			Current Protection	
		Cutties?	Green?	Blue?	Out Wtr?	ISF?
Barlow Creek	1	y				Y
Bear Creek	1	y				Y
Bear Creek Little	4					
Burnett Creek	4					
Clear Creek	5					
Coal Creek	1	y			y*	y
Coke Oven Creek	3	y			y*	y
Dolores River (#5)	2	y		y		
Dolores River West Fk	2	y			y*	y
East Fork Dolores River	1	y				?
Fall Creek (Dunton)	3	y				
Fall Creek East Fk	2	y				y
Fish Creek @ SWA	1					y
Fish Creek Little (#1)	3					?
Grindstone Creek	4	y				
Horse Creek	2					
Kilpacker Creek	3	y			y*	
Lizard Head Creek	2	y				
Lost Canyon (above Dipping Vat Creek)	2					
Lost Canyon Creek (All)	5					
Lower Dolores (#4)	4					
Marguerite Creek	4					
Meadow Creek	2				y*	y
Morrison Creek	2	y		y		
Nash Creek	3	y				
Priest Gulch	4	y	y			y
Rio Lado	5	y	y		y	
Roaring Forks Creek	2	y	y			y
Rough Canyon	2	y	y			
Ryman Creek	5					
Scotch Creek	4					y
Silver Creek (above Rico pond)	1					y
Slate Creek	1	y	y		y*	y
Snow Spur Creek	1	y				y
Spring Creek	3	y	y		y	
Stoner Creek	2	y	y			
Straight Creek	4					
Taylor Creek	4	y				y
Taylor Creek Little	5	y	y		y	
Tenderfoot Creek	5	y				
Twin Creek North	1	y		y		
Twin Creek South	2	y		y		
Upper Groundhog Creek (#2)	3					
Wildcat Creek	5	y	y			y
Willow Creek	3				y*	
* only that portion in Lizard Head WA						
** DRA's de-watering vulnerability analysis						

Stream List Working File

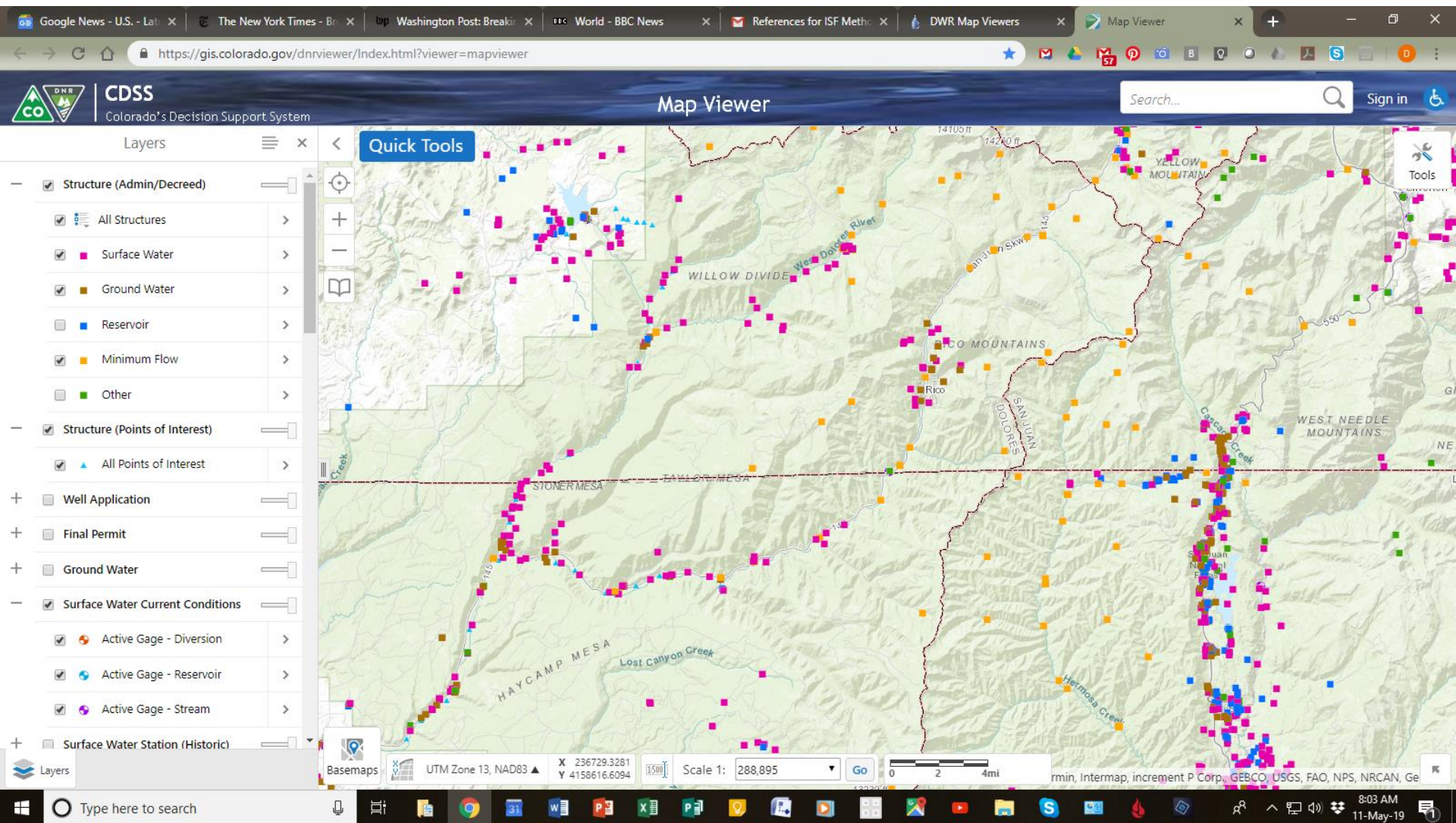


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Diversion Structures in the SA



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In-Stream Flow: Getting It In Place

- ▶ Authorization: Colo. Rev. Stat. § 37-92-102 (3)
- ▶ Responsible Agency: Colorado Water Commission Board
- ▶ Programs:

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, etc.

ISF Criteria - CWCB

The Board must make 3 determinations before applying to water court for an ISF water right:

(1) A natural environment exists

Typically identified by the presence of a coldwater fishery, but other indicators can be used (warm water fishery, riparian vegetation)



(2) Water is available for appropriation

- Determined by water right and hydrologic investigations
- Daily Median hydrology when available –water available 50% of time

(3) No material injury to other water rights will occur

- 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

ISF Appropriation Process

- ▶ Any person or entity may recommend streams or lakes to be considered for appropriation to preserve the natural environment Recommendation Development
- ▶ Collect data and quantify flow requirements.
- ▶ Submit recommendations “with specificity and in writing” at annual ISF Workshop.
- ▶ Identify stakeholders and participate in outreach efforts.
- ▶ Testify on natural environment and flow requirements if there is a contested hearing.
- ▶ CWCB uses public notice and comment procedure

Factors In The Appropriation Process

- ▶ Using two-board meeting process, CWCB considers these factors:
 - ▶ Reach of stream where acquired water will be used
 - ▶ Historical use and return flows
 - ▶ Location of other water rights on reach
 - ▶ Potential for material injury to existing decreed water rights
 - ▶ Effect of proposed acquisition on
 - ▶ Interstate compact issues
 - ▶ Maximum utilization of waters of state
 - ▶ Whether water will be available for subsequent use downstream
 - ▶ Water administration issues, if any

Determining “Minimum Flow”

- ▶ Considerations: seasonal flow variation related to species and stages of life cycle, stream morphology
- ▶ Evolution of hydrological techniques/concepts
 - ▶ R2Cross Manual is being updated (Release: Summer 2019)
- ▶ Field protocols and rigor of data effort
- ▶ “Rules Concerning The Colorado Instream Flow And Natural Lake Level Program, 2 CCR 408-2”

Birch - DNR, Katie

Fri, May 10,
2:37 PM

to me

Hi Duncan -

Glad you were able to find the R2Cross protocol on the CWCB's website. As I mentioned on the phone, we are updating the R2Cross model currently. R2Cross is a single transect model which produces a stage-discharge relationship using Manning's equation (for the velocity relationship). Manning's equation only produces a reliable estimate for flow recommendations between 40 and 250% of the flows measured. As you can imagine, this has limited us recommenders because we were chasing flows within range. Scientists and engineers have developed other velocity relationships in the past 30+ years, so the new R2Cross model will include Manning's equation plus new velocity relationships, which rely on user-supplied D84 from a pebble count. Everything else will look largely the same, but we recommend surveyors collect a pebble count. This updated protocol will be available mid-summer.

Another ISF quantification method used in Colorado is PHABSIM/IFIM, which is a multiple-transect model that compute suitable habitat (for various life stages and species) as a function of discharge. These procedures are much more involved and costly. Unlike R2Cross, this is an incremental method, which means although it produces an "optimal" flow where habitat is maximized, it is most useful in evaluating various water management scenarios.

There are a number of other methods used by other states including the following:

- Tennant (Montana) Method - purely an office exercise based on percentile flows from a gage
- Wetted Perimeter Method
- Toe-Width-Method

I can't speak to the methods used by other states, but wanted to make you aware of these. Hope that's enough to get you started (but not overload you). Let me know if you have questions.

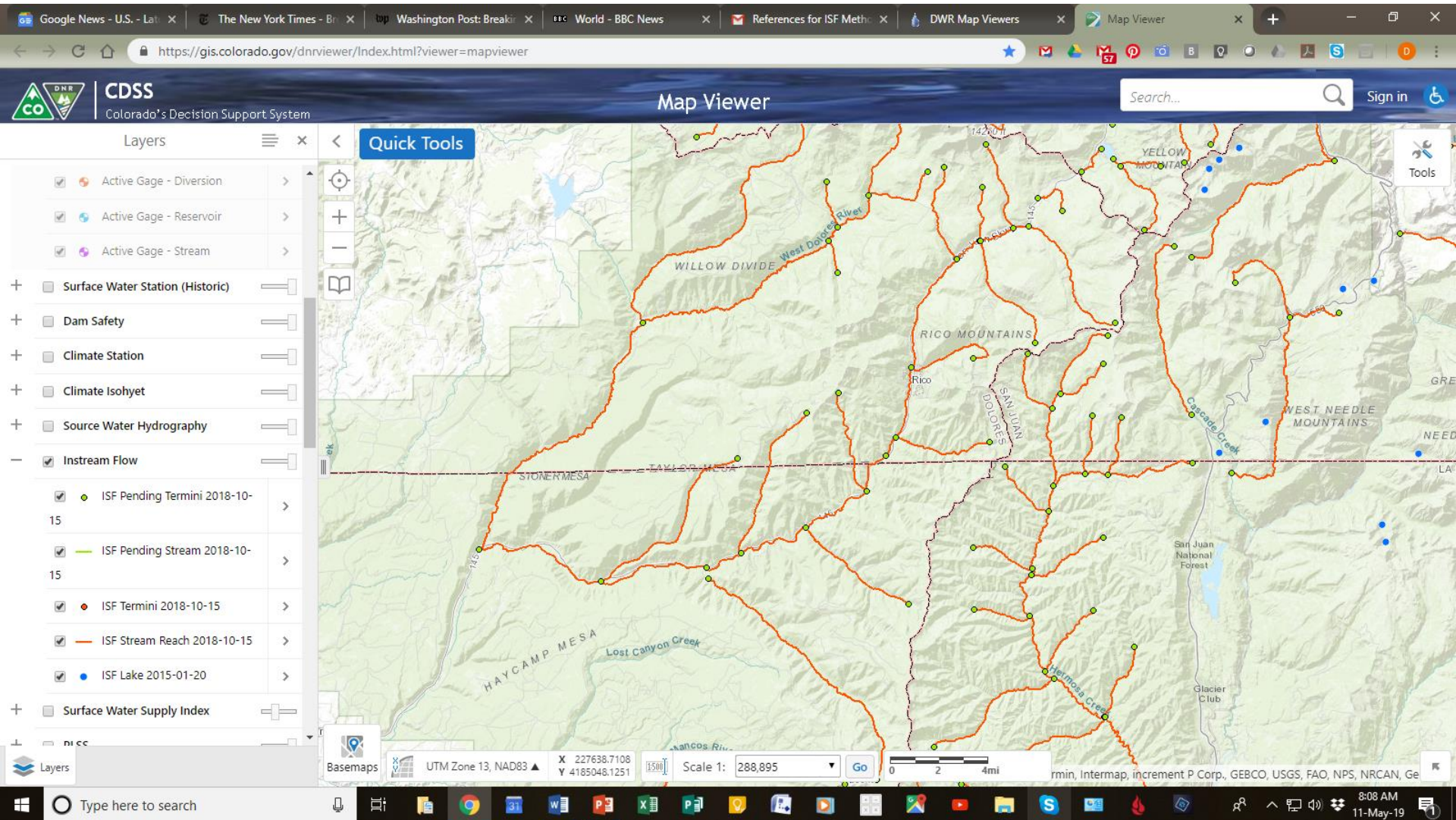
Cheers,
Katie



Timeframe

Date	Procedure
Year 1 - February	<p>Recommendations are submitted to Board or staff, in writing with specificity, no later than the date of the February workshop in order to be considered for appropriation the following January. At a minimum, the recommendations must include the following:</p> <ul style="list-style-type: none"> • Stream name, location and the upper and lower termini of the proposed ISF reach. • Documentation of the existence of a natural environment (i.e., fishery survey or other info.) • Quantification of the amount of water required to preserve the natural environment to a reasonable degree. • Hydrologic analyses which indicate that water is available for appropriation on the proposed stream reach <p>Specific information as to why the recommending entity has prioritized and recommended the stream or lake for protection under the ISF Program.</p>
Year 1 - March	A list of the stream reaches being recommended for appropriation are sent to the instream flow subscription mailing list and are noticed at the March Board meeting
Year 1 - February to January of Year 2	Staff analyzes the information provided by the recommending entities in order to provide the Board with accurate information to make the required findings as outlined in ISF Rule 5i.
Year 1 - March to March of Year 2	Staff works with Board members and the public to identify concerns and develop solutions.
Year 2 - January	Staff recommends that the Board form its intent to appropriate.

In-Stream Flow Decreases In SA



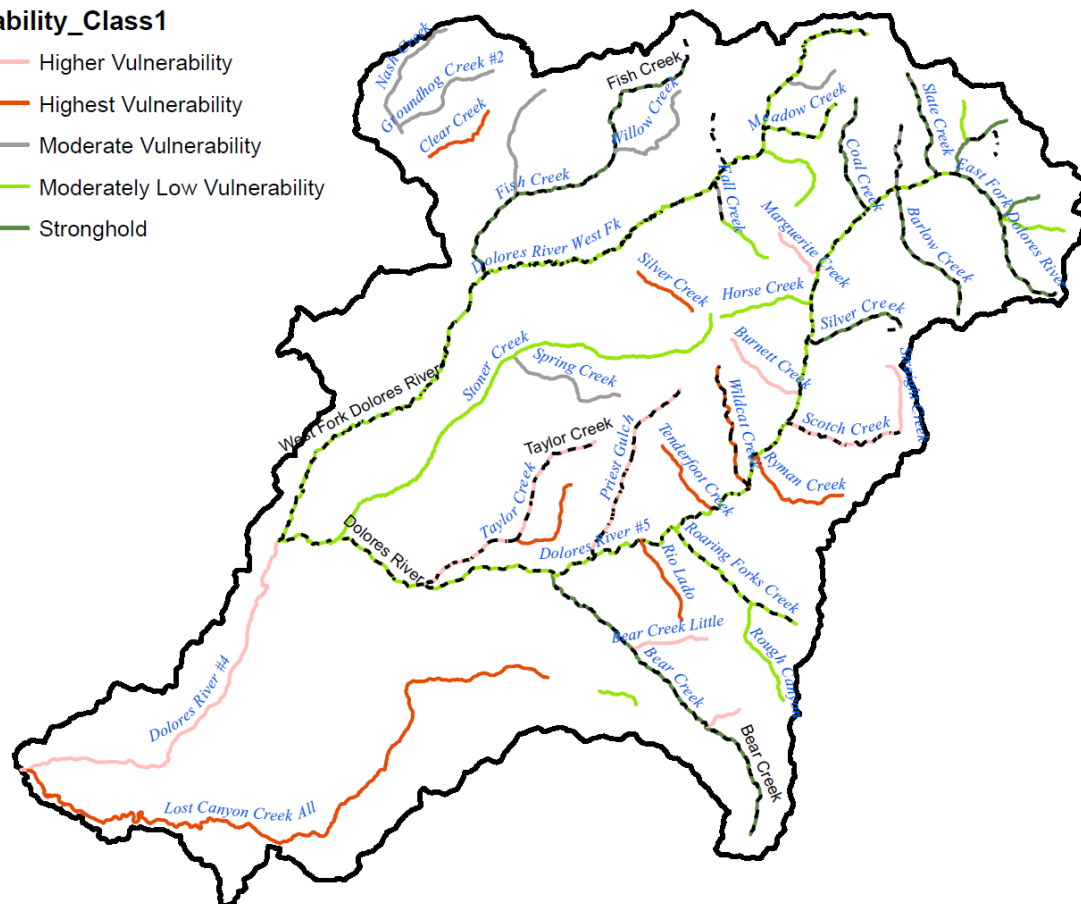
Legend

----- ISF_Reaches_Deceaded_Clip1

Trout_Streams

Viability_Class1

- Higher Vulnerability
- Highest Vulnerability
- Moderate Vulnerability
- Moderately Low Vulnerability
- Stronghold



In-Stream Flow: Management

- ▶ CWCB installs new stream gages and cooperates with USGS and DWR on existing stream gages.
- ▶ CWCB staff actively monitor flow conditions at more than 225 stream gages via the state's SMS Alert System.
- ▶ The system automatically alerts staff when flows approach and/or drop below decreed ISF amounts.
- ▶ Staff is alerted to low flow conditions within minutes by cell phone and emails and can immediately evaluate the situation.
- ▶ Non-gaged streams depend on calls to CWCB from field observations by local folks.

In-Stream Flow: Enforcement

- ▶ The CWCB protects its ISF water rights from injury by reviewing and evaluating all new water right applications for potential impacts to ISF rights, filing Statements of Opposition (SOP) with the Water Court if there is a potential for injury.
- ▶ Where warranted, staff can place an administrative call for water to prevent injury to an instream flow water right.

Setting the Stage: “Structure, Process, Substance”

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Outstanding Waters: Getting It In Place

▶ Authority:

- ▶ Federal Water Pollution Control Act ('48/'72/'77/'87)
- ▶ Delegated to states to implement with federal oversight

▶ Specific authority: Regulation No. 31 - The Basic Standards And Methodologies For Surface Water (5 CCR 1002-31), section 31.8(2)(b). ★

▶ Timeframe:

Present through 2021:	Collect water quality and other data, conduct outreach with appropriate stakeholders, work to develop proposal
October 10, 2020:	Issues Scoping Hearing (ISH) - WQCC - submit memo
August 2021:	Meet with division to discuss the proposal, supporting data and information collected, outreach conducted, and ripeness of proposal
November 13, 2021:	Issues Formulation Hearing (IFH) - WQCC, ripeness of proposal determined - submit memo
January 2022:	Submit proposal to WQCC Office
March 2022:	Proponent's Prehearing Statement (PHS) due - evidence supporting proposal
April 2022:	Responsive Prehearing Statement (RPHS) due
May 2022:	Rebuttal Statement (Rebuttal) due
June 2022:	Basin Rulemaking Hearing - WQCC

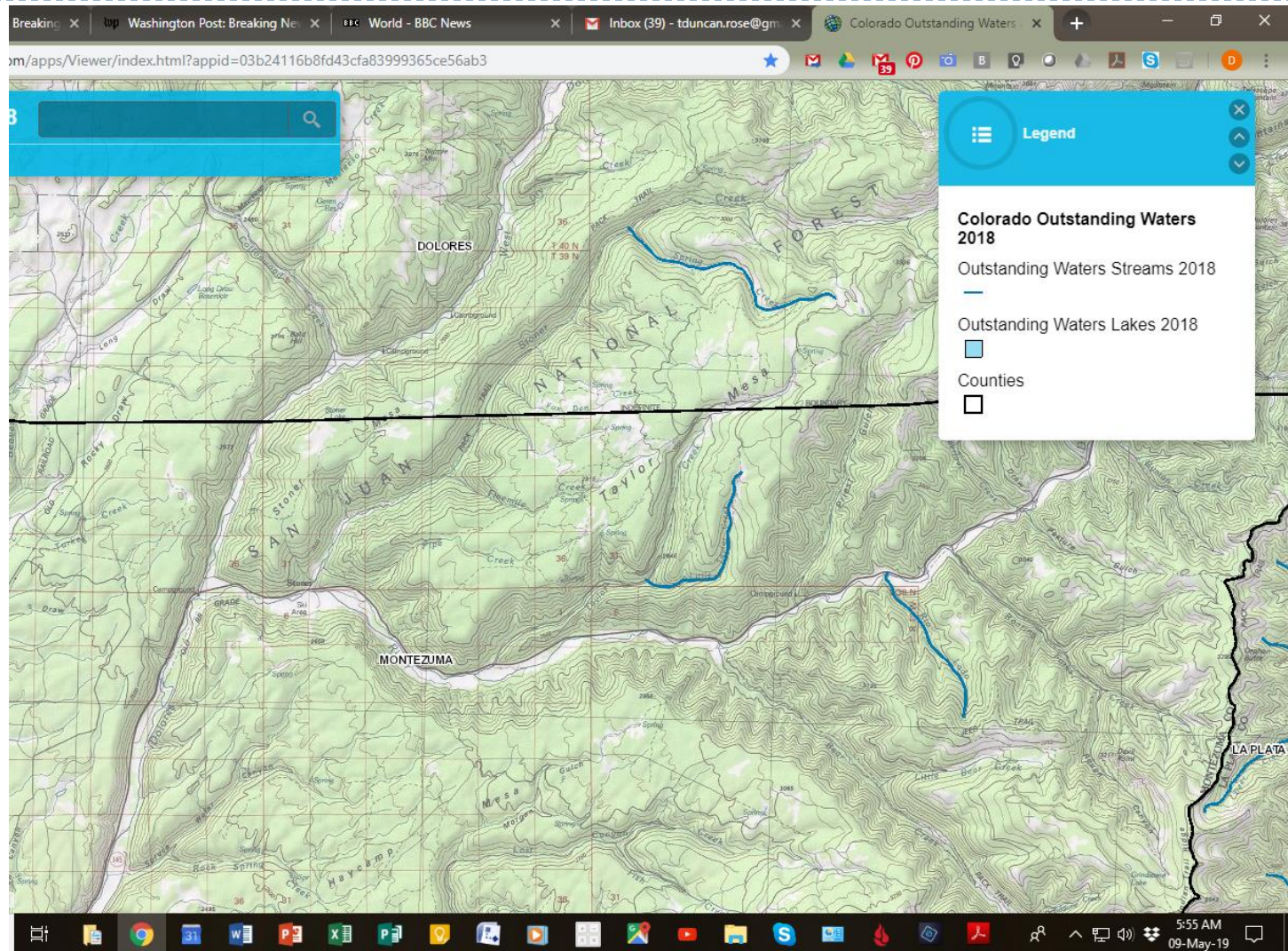
Getting It In Place - Requirements:

1. 12 stream parameters must be “equal to or better than that specified in tables I, II, and III for the protection of aquatic life class I, recreation class P and (for nitrate) domestic water supply uses:”
 - ▶ Table I: dissolved oxygen, pH, *E. coli*
 - ▶ Table II: chronic ammonia, nitrate
 - ▶ Table III: chronic cadmium, chronic copper, chronic lead, chronic manganese, chronic selenium, chronic silver, and chronic zinc
 - ▶ **AND**
2. The waters constitute an outstanding natural resource, based on the following:
 1. (A) The waters are a significant attribute of a State Gold Medal Trout Fishery, a National Park, National Monument, National Wildlife Refuge, or a designated Wilderness Area, or are part of a designated wild river under the Federal Wild and Scenic Rivers Act; **or**
 2. (B) The Commission determines that the waters have exceptional recreational or ecological significance, and have not been modified by human activities in a manner that substantially detracts from their value as a natural resource.
 3. **AND**
3. The water requires protection in addition to that provided by the combination of water quality classifications and standards and the protection afforded reviewable water under section 31.8(3) Antidegradation Review Process.

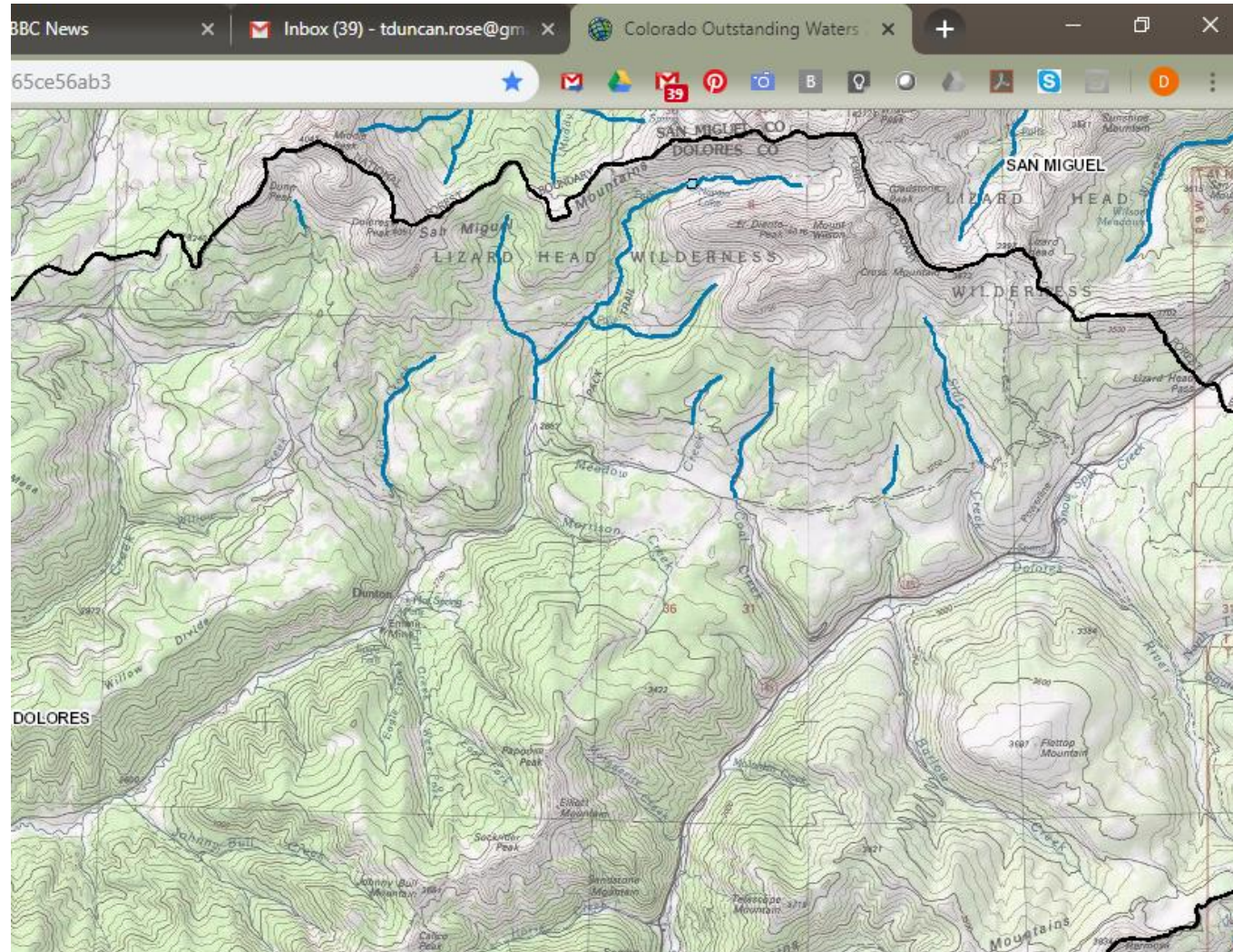
Outstanding Waters: Management

- ▶ Colorado Department of Public Health and Environment (CDPHE), Colorado Water Quality Control Division
- ▶ Streams with Outstanding Waters Designations:
 - ▶ Outside Lizard Head Wilderness Area:
 - ▶ Spring Creek
 - ▶ Little Taylor Creek
 - ▶ Rio Lada
 - ▶ Inside
 - ▶ Upper West Fork
 - ▶ Kilpacker Creek
 - ▶ Upper Slate Creek
 - ▶ Upper Coal Creek
 - ▶ Upper Coke Oven
 - ▶ Upper Meadow Creek
 - ▶ Upper Cold Creek
 - ▶ Unnamed Creek off Upper West Fork

Outside Lizard Head Wilderness Area



Inside The Wilderness Area



Outstanding Waters: Enforcement

- ▶ As a legally delegated (to the State of Colorado) component of the Federal Clean Water Act, the full array of federal enforcement procedures as stipulated in the statute and supporting regulations are available for enforcement in conjunction with and through state statutory enforcement and regulatory procedures.

Private Holdings in the SJNF

Google News - U.S. - Latest | The New York Times - Breaking | Washington Post: Breaking News | World - BBC News | Inbox (43) - tduncan.rose@gmail.com | Map Viewer

https://gis.colorado.gov/dnrviewer/Index.html?viewer=mapviewer

CDSS Colorado's Decision Support System

Map Viewer

Search... Sign in

Home Draw Measure Find Edit (Login Required)

Home Identify Pan Zoom In Zoom Out Initial View Previous Extent Next Extent Bookmarks Export Upload Data Add Layers Layer Catalog Share Print

Navigation Sharing

Layers

- Designated Basin
- Management District
- Water Division
- Water District
- ☒ County
- ☒ City
- ☒ Public Land
- ☒ State Trust Land
- Water Conservation District
- Water Conservancy District
- Critical Area
- Republican River
- Measurement Boundary

Quick Tools

Basemaps

UTM Zone 13, NAD83

X 171474.5827
Y 4195652.0931

Scale 1: 577,791

0 3 6mi

min, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Ge

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49

7:38 AM
12-May-19

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Basics of SMPs

- ▶ In 2016, the State of Colorado adopted Colorado's Water Plan which creates a water management roadmap to achieve a productive economy, vibrant and sustainable cities, productive agriculture, a strong environment, and a robust recreation industry.
- ▶ Specific to protecting and enhancing stream flows, the plan calls for **80 percent of locally prioritized rivers to be covered by Stream Management Plans (SMPs) by 2030.**
- ▶ SMPs develop data-driven water management and physical project recommendations capable of protecting or enhancing environmental and recreational values on streams and rivers.
- ▶ The State of Colorado allocates \$5 million annually to a grant program to develop projects and plans that protect or restore watershed health and stream function. This funding has kick-started local interest across Colorado to develop Stream Management Plans.

CWCB Requirements

Well-developed Stream Management Plans should be grounded in the complex interplay of biology, hydrology, channel morphology, and alternative water use and management strategies.

According to the CWCB grant application guidelines:

“Well-developed Stream Management Plans should be grounded in the complex interplay of biology, hydrology, channel morphology, and alternative water use and management strategies. They should also consider the flow and other structural or management conditions needed to support both recreational uses and ecosystem function. A stream management plan should:

- 1. Involve stakeholders to ensure their acceptance of the plan;*
- 2. assess existing biological, hydrological, and geomorphological conditions at a reach scale;*
- 3. identify flows and other physical conditions needed to support*

environmental and recreational water uses;

- 4. incorporate environmental and recreational values and goals identified both locally and in a basin roundtable’s BIP; and*
- 5. identify and prioritize alternative management actions to achieve measureable progress toward maintaining or improving flow regimes and other physical conditions. For basin roundtables, local stakeholder groups, and decision makers, such plans can provide a framework for decision-making and project implementation related to environmental and recreational water needs.”*

CWCB's Steps in the SMP Process

- ▶ (1) Gathering stakeholders to participate in plan development;
- ▶ (2) identifying the plan's objectives;
- ▶ (3) identifying and prioritizing ecological and recreational values;
- ▶ (4) establishing goals for flows and other physical conditions in order to protect or enhance environmental and recreational attributes on streams and rivers within a given watershed;
- ▶ (5) collecting and synthesizing existing data describing flows for river ecosystems, boating, or other needs in the watershed;
- ▶ (6) assessing existing physical conditions of stream reaches, including geomorphological and riparian conditions;
- ▶ (7) selecting quantitative measures that can be used to assess progress made toward articulated goals;
- ▶ (8) determining what new information is needed and the best methods for obtaining that information;
- ▶ (9) quantifying specific numeric flow recommendations (or ranges of flow) and physical conditions and assessing the potential for channel reconfiguration to support environmental and recreational values;
- ▶ (10) identifying temporal, geographical, legal, or administrative constraints and opportunities that may limit or assist in the basin's ability to meet environmental and recreational goals; and
- ▶ (11) implementing a stakeholder-driven process to identify and prioritize environmental and recreational projects and methods.

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LMP Vol II, Sec 2: Resources Direction

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- 2.4.25 Livestock browsing should not remove more than 25% of the annual leader growth of hydrophytic shrubs and trees.
- 2.4.26 Agency actions should avoid or otherwise mitigate adverse impacts to the abundance and distribution of willows to maintain or improve the ecological integrity of riparian area and wetland ecosystems.
- 2.4.27 Certified, weed-free native seed mixes of local ecotypes should be used to revegetate riparian area and wetland ecosystems where commercially available. Non-native, non-invasive plant material may be used in limited situations where considered necessary in order to protect resources and/or stabilize soils in a timely fashion. Persistent non-natives or invasive exotic plant species should be avoided.
- 2.4.28 Woody riparian vegetation along low-gradient ephemeral and permanent stream channels should be maintained or restored to ensure terrestrial food sources for invertebrates, fish, birds, and mammals, and to minimize water temperature changes.

Additional Guidance

The principal guidelines used to protect all riparian areas and wetlands on SJNF lands are found in the Region 2 Watershed Conservation Practices Handbook (Region 2 FSH 2509.25-2006-1). This handbook contains guidelines that prevent adverse impacts, maintain or improve stream health, preserve ecosystem function, prevent stream sedimentation, and reclaim disturbed sites. Additional guidance includes:

- Colorado River Basin Salinity Control Act of 1974
- Clean Water Act of 1977
- EOs 11288, 1966; 11752, 1973; 11988, 1977; 11990, 1977
- FSM 2500
- FSH 2500
- MOU between the Colorado Department of Natural Resources and the USFS, 2004
- MOU between the Colorado Department of Natural Resources, the Colorado Water Conservation Board, and the BLM, 2005
- FSM 2070
- FSH 2509.13 Burned Area Emergency Rehabilitation.
- Additional standards and guidelines associated with riparian area and wetland ecosystems are found in Sections 2.2 and 2.7.

2.5 Aquatic Ecosystems and Fisheries

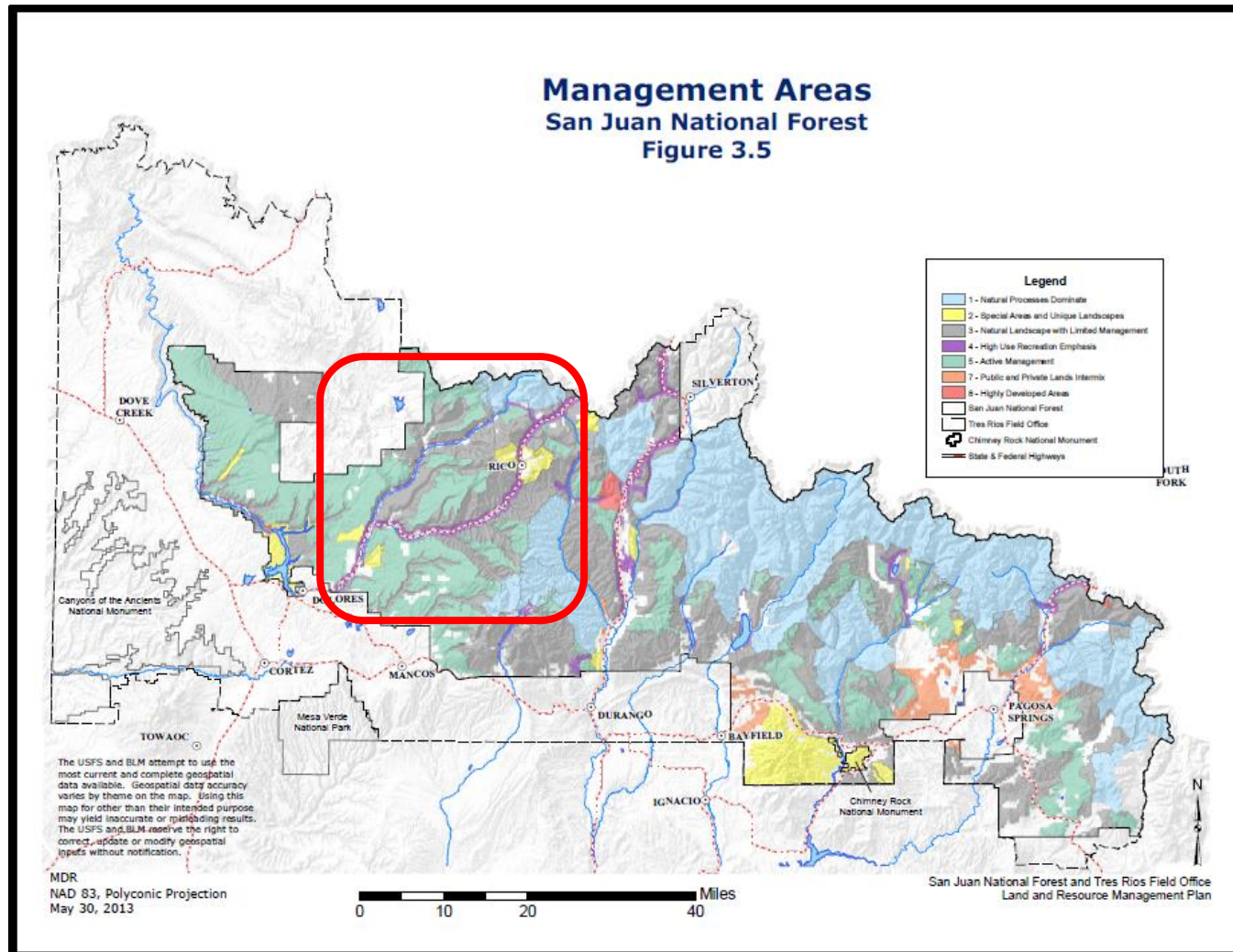
Introduction

Aquatic ecosystems of the SJNF and TRFO support a variety of water-dependent species, populations, and communities of plants and animals. These ecosystems include various types of flowing and standing waters that provide aquatic habitats sufficient to support the many biotic communities that depend on abundant, clean waters. The major biological components of these ecosystems include fish, amphibians, macroinvertebrates, zooplankton, macrophytes, and periphyton communities. The physical components are composed of features such as stream gradient, sinuosity, substrate material, stream bank material, large woody debris, and most importantly, water (refer also to Section 2.6, Water Resources).

These aquatic ecosystems play a critical role in the social, economic, and ecological well-being of the region. In addition to supporting some of the richest and most productive habitats for a variety of wildlife and plant species, they provide municipal and industrial water to communities, and serve as one of the primary recreational resources of the area. According to the USFWS National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, fishing related expenditures contributed over \$41.8 billion to the U.S. economy in 2011 (USFWS 2013b). Over 33 million anglers, 27 million of which were freshwater anglers, contributed an average of \$1,261 each to local economies, and the demand for fishing-related recreation



LMP: Sec 3.5: Area Direction - Management Areas



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Working List of State, Federal and Local Stream Protection Tools

▶ **I. State Protection Mechanisms**

- ▶ **A. Colorado Instream Flow Program**
- ▶ B. Colorado Law and Intergovernmental Agreements
- ▶ C. Gold Medal Waters
- ▶ **D. Outstanding Waters**
- ▶ **E. Stream Management Plans (SMPs)**
- ▶ **F. CPW/NFS - Fishing Regulations**
- ▶ **G. CPW/NFS - In/near/associated-stream intervention techniques**

▶ **II. Federal Protection Mechanisms**

- ▶ **A. U.S. Forest Service ("USFS") Land Management Plans ("LMPs").**
 - ▶ **1. Management Area Designations (MA 1, MA2, M3)**
 - ▶ **2. Special Areas and Designations:**
 - ▶ **a. Area of Critical Environmental Concern**
 - ▶ **b. Wildlife Management Area**
 - ▶ **2. Conservation Watershed Network for Native Fishes**

- ▶ **B. Wild and Scenic Rivers Act of 1968 ("WSR")**
- ▶ **C. Wilderness Designation: Wilderness Act of 1964 ("Wilderness Act")**
- ▶ **D. National Conservation Areas ("NCAs")**
- ▶ **E. Federal Research Areas**
- ▶ **F. Other Federal Legislation (special)**
 - ▶ **1. (Rio Grande and North St. Vrain Creek)**
 - ▶ **2. South Platte Protection Plan (WSR suitability determination held in abeyance).**
 - ▶ **3. Rio Chama Management Plan**

▶ **III. Local/Other**

- ▶ **A. Conservation Easements**
- ▶ **B. County Land Use Codes**
- ▶ **C. Contractual Arrangements**

Today's Discussion Guide

▶ **Session I**

- ▶ **Review Discussion Guide, introductions, quick review of charge to Task Team,**
- ▶ **Setting the Stage: “Structure, Process, Substance”**
 - ▶ *Structure – envisioning a product - what is our “Deliverable”?*
 - ▶ *Process – how will we achieve the Deliverable?*
 - ▶ *Substance – what is in the Deliverable?*
- ▶ **Testing/Applying the Process**
 - ▶ *Procedural final-resolution: a “vulnerability/resilience” and “priority order” based “working draft” proposal presented for consideration? (Jim/Clay/Garrett/Duncan)*
 - ▶ *Finalize which streams are in the Test Group*
 - ▶ *Apply and test the match-stream-to-best-protection-tool(s) process to the Test Group*
- ▶ **Offline: Write-up, circulate, rework, submit to Task Team, refine, approve**
- ▶ **Session 2(+) Development/finalization of Implementation Work Plan as needed (TBD)**
- ▶ **Submit to Working Group for consideration**

Toward A Weighted, Multi-criteria Decision Table For Session 1

- ▶ What is the ranking objective to be accomplished (“what question(s) are we asking?”)?
 1. Which of our 44 streams are most resistant to feasible (identified) disturbances? Which are least? or
 2. Which streams have most “eco/community value”? Which least?



Q1. Which Of Our 44 Streams Are Most Resistant To Feasible (Identified) Disturbances?

► Potential List of Disturbances:

1. Dewatering (natural, human)
2. Stream temperature increase
3. Wildfire including triggered sedimentation/debris flow
4. Non-wildfire erosion, sedimentation
5. Flash flooding wash-out
6. Land activity/development
7. Over-fishing?



Example, Weighted, Multi-Factor Decision Table

Note: lower score is better	Resistance/Resilience						Cutties			Points
Factors	Dewtr	Temp	Wildfire	NWEros	FishFld	LandUse	Green?	CRT?	Other?	
Weights (%)	1	1	1	1	1	1	1	1	1	9
Value range	1-5	1-3	1-3	1-3	1-3	1-3	1,3	1,3	1,2	
STREAM NAME	5	3	3	3	3	3	3	3	2	28
Barlow Creek	1	1	1	1	1	1	1	1	1	9
Bear Creek	1	2	2	2	2	2	3	3	2	19
Bear Creek Little	4	1	3	2	3	1	1	1	1	17
Burnett Creek	4	1	2	2	3	2	3	3	2	22
Clear Creek	5	3	2	1	1	3	1	3	2	21
Coal Creek	1	1	1	1	1	1	3	1	2	12
Coke Oven Creek	3	1	1	1	1	1		1	1	10
Dolores River West Fk	2								1	3
East Fork Dolores River	1								1	2
Fall Creek (Dunton)	3								1	4
Fall Creek East Fk	2								1	3
Fish Creek @ SWA	1									1
Fish Creek Little (#1)	3									3
Grindstone Creek	4								1	5
Horse Creek	2									2
Kilpacker Creek	3								1	4
Lizard Head Creek	2								1	3
Lost Canyon (above Dipping Vat Creek)	2									2
Lost Canyon Creek (All)	5									5

Q2. Which streams have most “eco/community value”? Which least?

Broad View “Total Stream Value” Focus Example

SMIRF ID	Ecosystem Condition										Benefits to Local Communities															
	Ecological Integrity	Flow Regime	Sediment Regime	Water Quality	Network Connectivity	Floodplain Hydrology	Riparian Vegetation	Stream Corridor Dynamics	Structural Complexity	Aquatic Biota	Provisioning	Agricultural Production	Drinking Water Supply	Industrial Processing	Hydropower Production	Regulating and Maintenance	Flood Regulation	Groundwater Recharge	Erosion Control	Pest Regulation	Regulatory Compliance	Cultural	Aesthetics and Intrinsic Values	Symbolic/Emblematic Species	Boating Recreation	Angling Recreation
1.1		1	2	1	0	0	2	3	2	1		1	4	0	1		1	2	3	2	1		1	1	1	2
1.2		2	3	2	2	3	3	4	1	1		2	2	3	2		2	3	4	1	1		2	2	2	4
1.3		4	3	3	3	1	3	5	3	2		3	3	1	4		4	3	5	3	2		4	2	4	5
2		4	2	4	2	3	2	2	2	2		4	5	3	4		4	2	2	2	2		4	2	4	5
3.1		4	4	4	3	5	4	3	5	3		4	1	5	3		4	4	3	5	3		3	2	3	1
3.2		1	1	1	0	0	1	1	2	1		1	4	0	1		1	1	1	2	1		1	0	1	2
4		3	2	3	4	2	2	1	5	4		3	4	2	3		3	2	1	5	4		3	2	3	2

Narrower “Ecosystem Condition” Focus Example

Table 8.1: Ranking of Existing Trout Streams in Study Area by Long-Term Vulnerability to Climate Change (Low to High)

OBJECT ID	STREAM NAME	Quintile	Composite Score	Stream Length Miles	Watershed Size Sq Miles	M7D10Y Low Flow	Mean Annual Precip	Mean Basin Elevation	Mean Basin Wall Slope	% Area watershed above 7500ft	Elevation of Stream Mouth	Headwtrs elevation	Average Gradient	Miles by Category
Quintile 1: Lowest Vulnerability														
142	East Fork Dolores River	1	11	6.35	1	1	1	1	2	1	1	1	2	
82	Barlow C		15	5.53	2	1	1	1	3	1	2	2		
87	Coal Cre		18	4.44	2	2						2		
16	Slate Cre		18	3.98	3	2						2		
127	Snow Sp		18	3.02	2	2						4		
125	Silver Cre		19	3.78	2	2						4		
139	Twin Cre		20	1.68	4	5						1		
83	Bear Creek	1	21	13.71	1	1						3		
101	Fish Creek @ SWA	1	21	12.95	1	1						3		
Quintile 2: Lower Vulnerability														
93	Dolores River West Fk	2	22	34.84	1	1						1		
15	Lizard Head Creek	2	22	1.45	5	5						3		
116	Meadow Creek	2	22	3.45	3	3						3		
130	Stoner Creek	2	22	17.99	1	1	5	5	2	1	5	1		
23	T			2.37	5	5	1	1	3	1	1	1		
117	N			3.56	4	5	2	2	1	1	2	3		
121	R			5.74	1	1	3	4	3	1	4	4		
122	Rough Canyon	2	23	3.95	2	2	2	3	3	1	3	3		
98	Fall Creek East Fk	2	24	2.06	5	5	1	1	4	1	1	1		
108	Horse Creek	2	24	3.40	3	2	1	2	5	1	3	2		
113	Lost Canyon (above Dipping Vat Cree)	2	24	1.50	5	5	2	3	1	1	1	3		
92	Upper Dolores (#5)	2	24	35.20	1	1	3	4	3	1	5	5		
Quintile 3: Moderate Vulnerability														
88	Coke Oven Creek	3							1	1	2	3		
96	Fall Creek (Dunton)								3	1		5		
102	Fish Creek								3	1		4		
111	Kilpacker C		25	2.00	5	5	1	1	5			3		
1	Nash Creel		25	4.72	2	3	4	5	1			5		
128	Spring Creek	3	25	4.58	3	3	4	4	1			3		
107	Upper Groundhog Creek (#2)	3	25	4.27	3	3	4	4				4		
141	Willow Creek	3	25	4.31	3	3	4	4			3	4	2	27.93
Quintile 4: Higher Vulnerability														
124	Scotch Creek	4	26	4.46	2	2	4				4	1		
131	Straight Creek	4	26	2.58	5	5				1	1	1		
91				14.68	1	1				2	5	5		
134				8.71	1	2			2	1	5	4		
105				1.43	5				4	1	2	5		
119	Priest Gulch	4	26	6.97	2			4	4	1	5	2		
84	Bear Creek Little	4	29	2.69				3	2	1	3	4		
85	Burnett Creek	4	29	3.28				2	5	1	3	1		
17	Marguerite Creek	4	29	2.10			2	2	5	1	2	2		
Quintile 5: Highest Vulnerability														
112	Lost Canyon Creek (All)	5	30			4	5	5	1	5	5	3		
18	Silver Creek (Johnny Bull)	5	30			5	3	3	5	1	2	1		
140	Wildcat Creek		30			3	4	4	5	1	4	1		
123	Ryman Creek		32		3	3	5	4	5	1	4	3		
86	Clear Creek		33		4	5	5	5	1	1	4	5		
135	Taylor Creek Little	5	33	3.46	4	5	5	4	2	1	4	4		
120	Rio Lado	5	37	3.29	4	5	5	5	4	1	5	4	4	
136	Tenderfoot Creek	5	37	2.95	4	5	5	5	4	1	4	4	5	50.28
Total Miles				296.1										296.1

9 Hydrologic attributes
for each stream from
StreamStats/GIS

Our 46 streams with Trout

Relative Vulnerability!

Composite
Worksheet:
Ranking 46
Trout
Streams by
Geophysical/
Hydrological
Vulnerability
(Streamflow)
[Low (Green)
to High (Red)]

“Does it
make
sense?”
Map!

Today's Discussion Guide

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- ▶ **Setting the Stage: “Structure, Process, Substance”**
 - ▶ *Structure – envisioning a product - what is our “Deliverable”?*
 - ▶ *Process – how will we achieve the Deliverable?*
 - ▶ *Substance – what is in the Deliverable?*
- ▶ **Testing/Applying the Process**
 - ▶ Procedural final-resolution: a “vulnerability/resilience” and “priority order” based “working draft” proposal presented for consideration (Jim/Clay/Garrett/Duncan)
 - ▶ **Finalize which streams are in the Test Group**
 - ▶ Apply and test the match-stream-to-best-protection-tool(s) process to the Test Group
- ▶ **Offline: Write-up, circulate, rework, submit to Task Team, refine, approve**
- ▶ **Session 2(+) Development/finalization of Implementation Work Plan as needed (TBD)**
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Thanks!

