

Background and Overview of the River Conditions Tool (RCT) Geographic Expansion 2021-22

A collaboration with the USFWS, MSU, MT DNRC, and Watersheds

Matt Heller, US Fish and Wildlife Service

2/28/2022



Chad
Carpenter's

TUNDRA

CRUD,
MY WEBSITE
IS DOWN.



Outline

1. Project background (what, when, why, who, how): 5-7 minutes
2. General Demo: 7-10 minutes
3. Draft Bitter Root data walkthrough: 5 Minutes
4. Discussion

The River Conditions Tool

What:

- Tool to support drought resiliency via a one-stop shop that summarizes various watershed information, including live Montana Fish Wildlife and Parks data, MTDNRC and USGS gage readings, and predetermined watershed conservation targets
- Water users can check the real-time status of river conditions of participating watersheds

When:

- Started project Spring of 2018
- Tool rolled out summer or 2019

https://uppermissouriheadwaters.org/river-conditions/

Upper Missouri HEADWATERS

Home About the Region Drought Resiliency Partners River Conditions

River Conditions Tool Home

Beaverhead-Central Big Hole Boulder Broadwater Gallatin-Lower Gallatin-Upper Jefferson Madison Ruby

Big Hole River Conditions

The Big Hole River Drought Management Plan designates target river flow and temperature conditions for fish health in five river sections of the Big Hole River. The plan includes voluntary conservation targets for all water users, MT FWP fishing restriction criteria, and information tools. Conservation actions are designed to support the health of the fishery. For more information, visit Big Hole Watershed Committee.

Montana FWP stream restrictions in this area? Click section in "Summary of Conditions" below for detailed information and here for official information...
Portions of the Big Hole River from Sprague Bridge or dam at Maude Point to the North Fork Big Hole River
Stream: Big Hole River - Section 1

Summary of Conditions

Click section listed below or on Map for detail display below the Map Legend
Conditions based on the last 3 days (9/14/2020-9/17/2020)

Stream	Big Hole River
Section	1 @ Big Lake Cr at Wisdom
Streamflow (cfs)	15 (3 day trend —)
H2O Temp (F)	48 (3 day trend —)
Status	MT FWP Official Restriction (click for details)

Stream	Big Hole River
Section	2 near Wise River
Streamflow (cfs)	152 (3 day trend —)
H2O Temp (F)	47 (3 day trend —)
Status	PREPARE FOR CONSERVATION

Stream	Big Hole River
Section	3 at Maude Rock nr Divide
Streamflow (cfs)	263 (3 day trend —)
H2O Temp (F)	50 (3 day trend —)
Status	Open

Stream	Big Hole River
Section	4 near Glen
Streamflow (cfs)	288 (3 day trend —)
H2O Temp (F)	"Not collected (3 day trend —)
Status	PREPARE FOR CONSERVATION

Stream	Big Hole River
Section	5 @ Hamilton Ditch nr Twin Bridges
Streamflow (cfs)	165 (3 day trend —)
H2O Temp (F)	54 (3 day trend ↓)
Status	PREPARE FOR CONSERVATION

* Indicates the reading (streamflow and/or temperature) for this USGS site is not collected. To find out more information, click a stream section in the summary, next click the "USGS Source Data - Current" web link under "Stream Section Detail"

Map Legend

River Status
■ Preps ■ Unofficial Closure ■ Official Restriction
— Stream Section (Open)

Gages
● TRIGGER MEASURE LOCATION ● USGS ● MTDNRC ● BOR

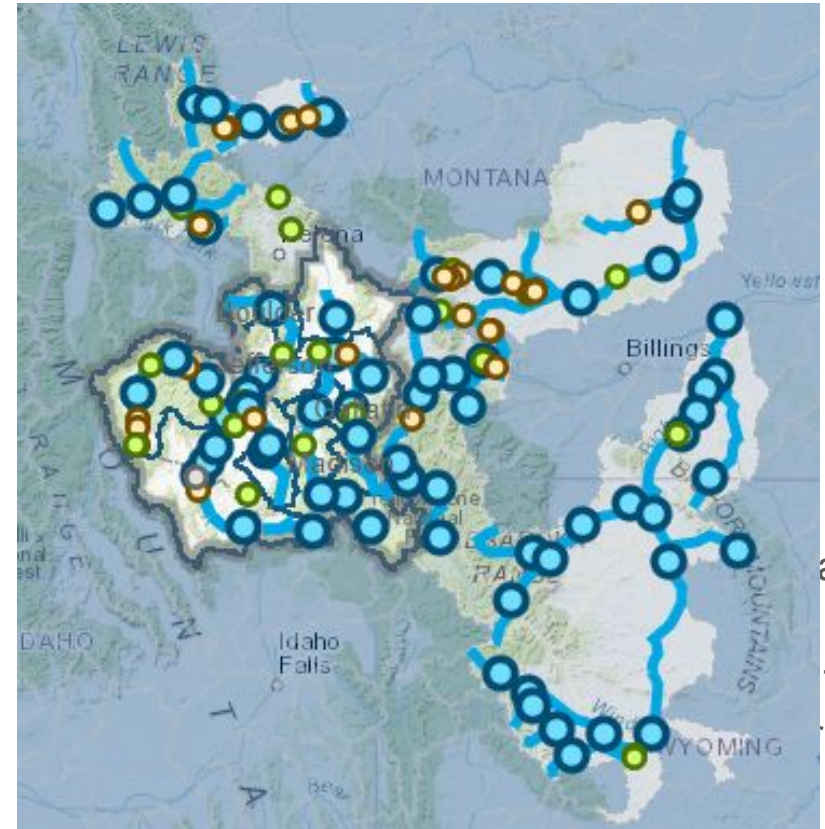
Start/End Section Locations
▲ Start ▼ End

Stream Section Discharge (CFS)

Quick Recap of the River Conditions Tool - Who

Project Participants (former and current)

- 3 new Watershed Groups
 - Bitter Root Water Forum
 - Flathead Lakers and Flathead CD
 - Clark's Fork of the Yellowstone and Rock Creek near Roberts/Red Lodge, MT
- 14 Existing Watershed Groups
 - All the watershed of the UMH (except the Boulder)
 - Upper Yellowstone/Shields
 - Bighorn
 - Blackfoot
 - Sun
 - Musselshell



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Quick Recap of the River Conditions Tool - Who

RCT Users:

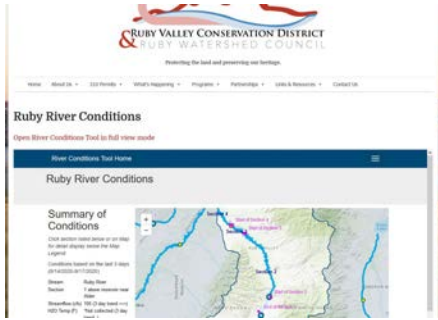
- Watershed groups
- Sport fisherman
- Boaters/floaters
- Working rivers community
- Anyone interested in aquatic well being and drought resiliency

How Organizations are Using the RCT

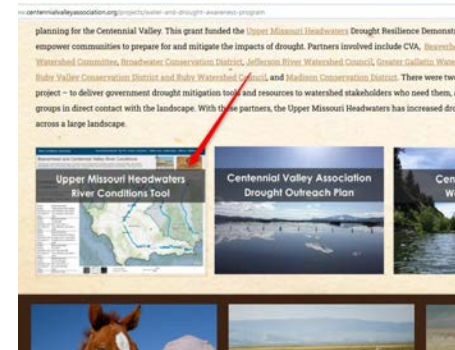
Hosted at: https://uppermissouriheadwaters.org/UMHW_RiverConditions/index.html



Some are embedding the tool in their websites



Some simply link to the tool



How Organizations are Using the RCT - Usage

- **Beaverhead Watershed Committee:** <http://www.beaverheadwatershed.org/beaverhead-river-conditions/>
- **Bighorn:** <https://www.bighornriveralliance.org/river-conditions-tool>
- **Upper Yellowstone:** <https://www.upperyellowstone.org/water-soil-monitoring>
- **Sun:** <https://www.sunriverwatershed.org/river-conditions>
- **Blackfoot:** <https://blackfootchallenge.org/river-map/>
- **Beaverhead Watershed Committee:** <http://www.beaverheadwatershed.org/beaverhead-river-conditions/>
- **Ruby Conservation District and Watershed Council:** <https://rvcd.org/ruby-river-conditions/>
- **Big Hole Watershed Committee:** <https://bhwc.org/river-conditions/>
- **Broadwater Conservation District:** <https://broadwatercd.org/missouri-river-conditions/>
- **Madison:** <https://madisoncd.net/> link in banner links to <https://uppermissouriheadwaters.org/river-conditions/>
- **Gallatin Watershed Council:** <https://www.gallatinwatershedcouncil.org/river-conditions>
- **Jefferson:** <http://jeffersonriverwc.com/river-conditions-webtool/>
- **Montana Trout Unlimited:** <https://montanatu.org/upper-missouri-watershed-river-conditions/>

How Organizations are Using the RCT - Cons. Targets

Many watershed groups using Temperature conservation targets (73 deg. F default), some also using Flow/Discharge

River Conditions Tool Home

display below the Map Legend

Conditions based on the last 3 days (9/14/2020-9/17/2020)

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Status	MT FWP Official Restriction (click for details)

Stream	Big Hole River
Section	2 near Wise River
Streamflow (cfs)	152 (3 day trend —)
H2O Temp (F)	47 (3 day trend —)
Status	PREPARE FOR CONSERVATION

Stream	Big Hole River
Section	3 at Maiden Rock nr Divide
Streamflow (cfs)	263 (3 day trend —)
H2O Temp (F)	50 (3 day trend —)
Status	Open

Stream	Big Hole River
Section	4 near Glen
Streamflow (cfs)	288 (3 day trend —)
H2O Temp (F)	*Not collected (3 day trend ↓)
Status	PREPARE FOR CONSERVATION

Stream	Big Hole River
Section	5 bl Hamilton Ditch nr Twin Bridges
Streamflow (cfs)	165 (3 day trend —)
H2O Temp (F)	54 (3 day trend ↓)
Status	PREPARE FOR CONSERVATION

* Indicates the reading (streamflow and/or

Map Legend

River Status

- Prepare
- Unofficial Closure
- Official Restriction

Stream Section (Open)

Gages

- TRIGGER MEASURE LOCATION
- USGS
- MTDNRC
- BOR

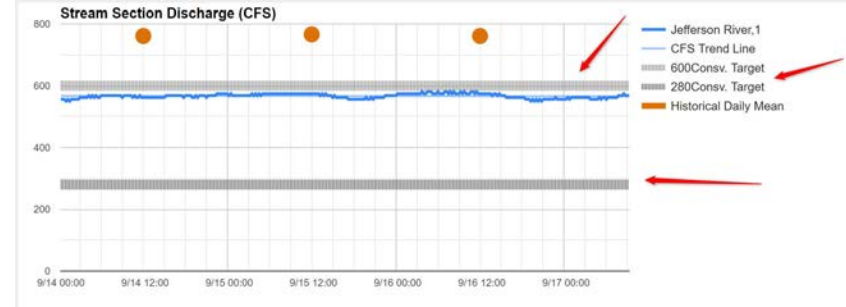
Streamflow Data

Current Discharge (cfs): 574 as of 9/17/2020 9:15 AM
3 day trend —

Stream status based on waterflow (cfs) targets: CONSERVATION

Waterflow target definitions for this stream section

PREPARE FOR CONSERVATION:	0 (cfs):River nearing low water conditions. River users notified to prepare to take conservation actions.
CONSERVATION:	600 (cfs):River has reached low flow conditions. River users asked to take conservation actions
PREPARE FOR RIVER CLOSURE (CLOSED TO FISHING)	280 (cfs):The angling closure will remain in effect until flows reach or exceed 300 cfs for seven consecutive days at the Twin Bridges Gage.



FWP Closures

Notifications on...

- Banner
- Summary
- Map

Weblinks back to official Press Release

https://uppermissouriheadwaters.org/river-conditions/

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Big Hole River Conditions

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Montana FWP stream restrictions in this area! Click section in "Summary of Conditions" below for detailed information and here for official information...
Portions of the Big Hole River from Sagshaw Bridge on Skinner Meadow Road to the north Fork Big Hole River
Stream: Big Hole River - Section 1

Summary of Conditions

Click section listed below or on Map for detail display below the Map Legend
Conditions based on the last 3 days (8/14/2020-8/17/2020)

Stream	Big Hole River
Section	1 bl Big Lake Cr at Wisdom
Streamflow (cfs)	15 (3 day trend →)
H2O Temp (F)	48 (3 day trend ↓)
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Stream	Big Hole River
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Stream	Big Hole River
Section	3 at Maiden Rock nr Divide
Streamflow (cfs)	283 (3 day trend →)
H2O Temp (F)	50 (3 day trend →)
Status	Open

Stream	Big Hole River
Section	4 near Glen
Streamflow (cfs)	288 (3 day trend →)
H2O Temp (F)	51 (3 day trend ↓)
Status	PREPARE FOR CONSERVATION

Stream	Big Hole River
Section	5 bl Hamilton Ditch nr Twin Bridges
Streamflow (cfs)	165 (3 day trend →)
H2O Temp (F)	54 (3 day trend ↓)
Status	PREPARE FOR CONSERVATION

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Map Legend

River Status

- Prepare
- Unofficial Closure
- Official Restriction

Stream Section (Open)

Gages

- TRIGGER MEASURE LOCATION
- USGS
- MTDNR
- BOR

Start/End Section Locations

- Start
- End

Stream Section Discharge (CFS)

Upcoming Work

Geographic Expansion: i.e. (Bitter Root)

Upcoming Web Tool Changes:

- Reservoir Gages
- Historical comparison in summary

Summary of Conditions

Click section listed below or on Map for detail display below the Map Legend

Conditions based on the last 3 days
(12/11/2021-12/14/2021)

Stream	Big Hole River
Section	1 bl Big Lake Cr at Wisdom
Streamflow (cfs)	*Not collected (3 day trend)
H2O Temp (F)	-1799966.2 (3 day trend —)
Status	Open

Stream	Big Hole River
Section	3 at Maiden Rock nr Divide



Watershed Participation for RCT Setup

Help find/create/verify GIS data (data creation is minimal by watershed POC)

- Gages
- Stream Sections
- Basin/Watershed

Web page content

- Header, hyperlinks

Other

- Monitoring information if wanted by watershed
- Misc suggestions (i.e. FWP fish survey database)

General Steps/Approximate Timeline

January 2022

1. RCT Core Team meet with Bitter Root POC (Andrea)

February 2022

1. RCT Core Team creates DRAFT map data and review with Bitter Root POC

May 2022

1. Finalize map data
2. Website coding/programming updates
3. RCT Core Team meets with for Bitter Root POC (Andrea) embedding or linking into their respective websites
4. **Online Launch**

Demo:

1. Banner
2. Under the Banner (Header)
3. Summary of Conditions
4. Map
 - a. Layers (Monitoring (### note BR input planned), etc.)
5. Flow and Temp Charts
6. Section Detail
7. Flow and Temp Charts
8. Retrieve Historic Closure/Restriction Information

This tool is hosted by the...

Upper Missouri Headwater group

Developed by yours truly in cooperation with the Upper Missouri Headwaters and its associated watershed coordinators.

Please check out the web page for contact info and help links

Draft data walkthrough:

1. Overall geographic area
2. Bitterroot River
 - Divided based on DEQ separations
3. Lolo Creek
4. West Fork Bitterroot River
 - Divided based on Painted Rocks Reservoir

Overall Area

West Fork of Bitterroot

→

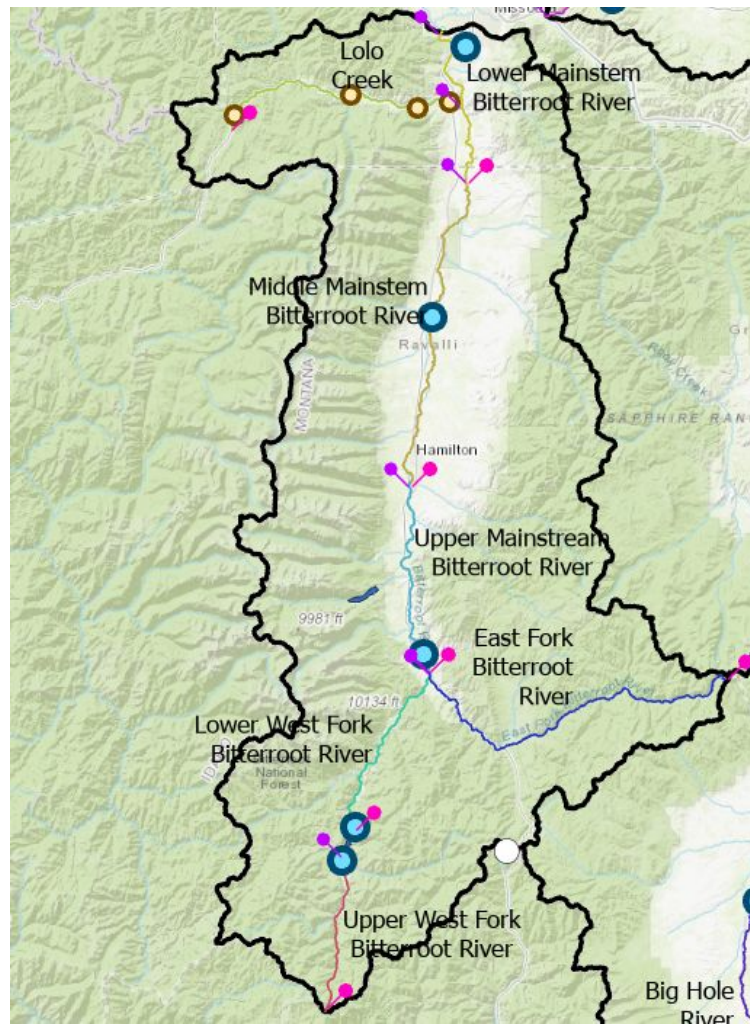
Main Stem of Bitterroot

→

Lolo Creek

Summary Gage: (a.k.a trigger gage)

- Gage we tie to a stream section for providing temp or flow summaries and analysis
- Try to have one gage per stream section



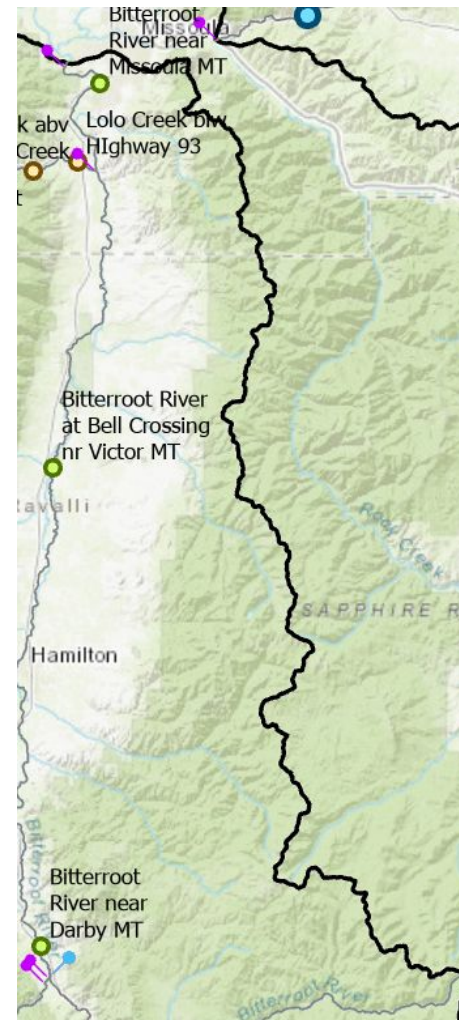
Mainstem

Confluence of the East and West fork



Confluence with Clark Fork

Based on Andrea's guidance, split the Main Stem into 3 sections



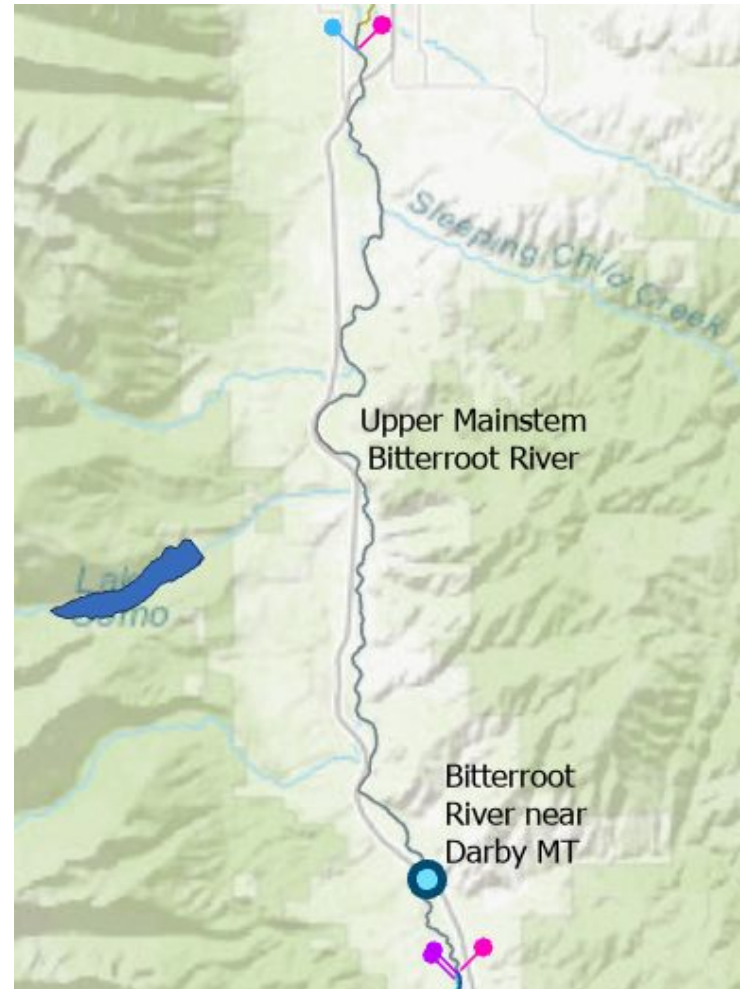
Upper

Confluence of East and West Fork

→

Sun Hawk Ln / “Anglers Roost” area

USGS Gage - Bitterroot River near Darby
MT



Middle

Sun Hawk Ln / “Anglers Roost” area



Eastside Hwy crossing / Eightmile
Creek area

USGS Gage: Bitterroot River at Bell
Crossing nr Victor MT



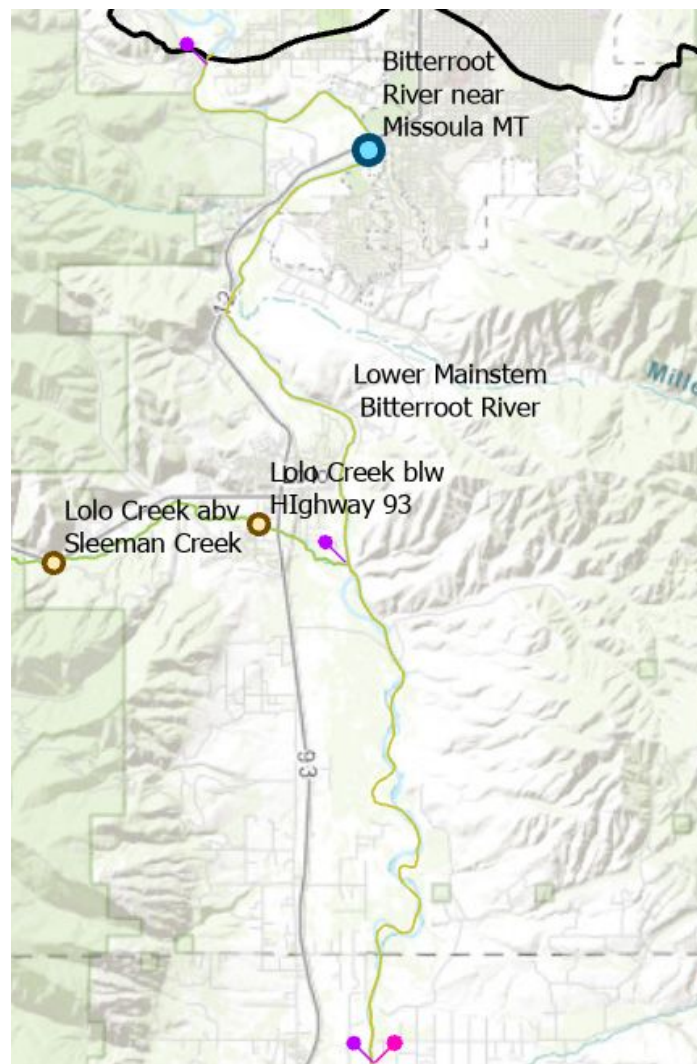
Lower

Eastside Hwy crossing/Eightmile
Creek area

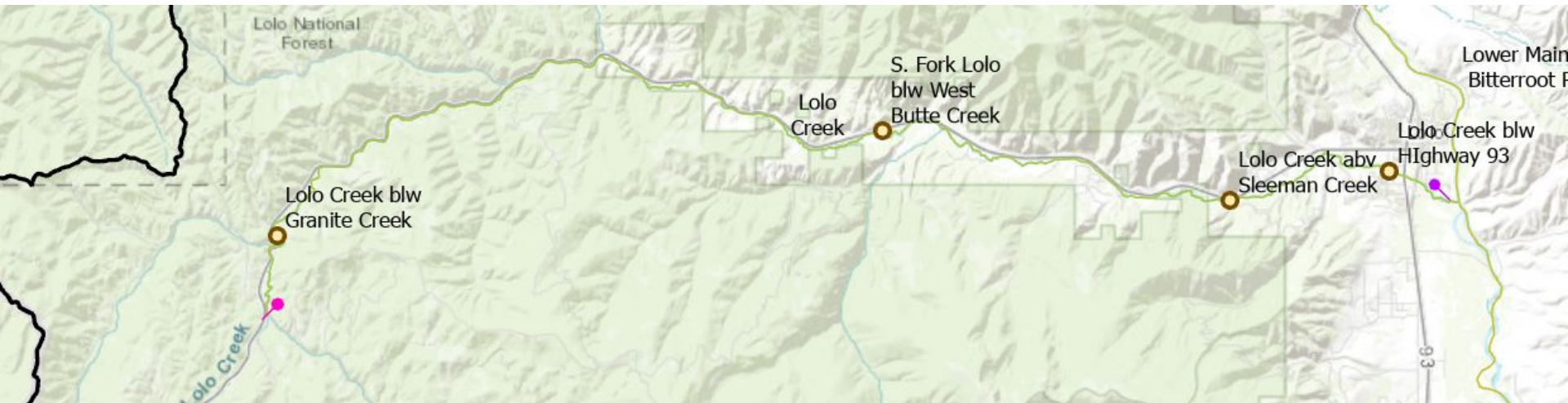
→

Confluence with Clark Fork

USGS Gage: Bitterroot River Near
Missoula



Lolo Creek



2 Real time DNRC gages we can use

1. Lolo Creek abv Sleeman Creek
2. Lolo Creek below Highway 93

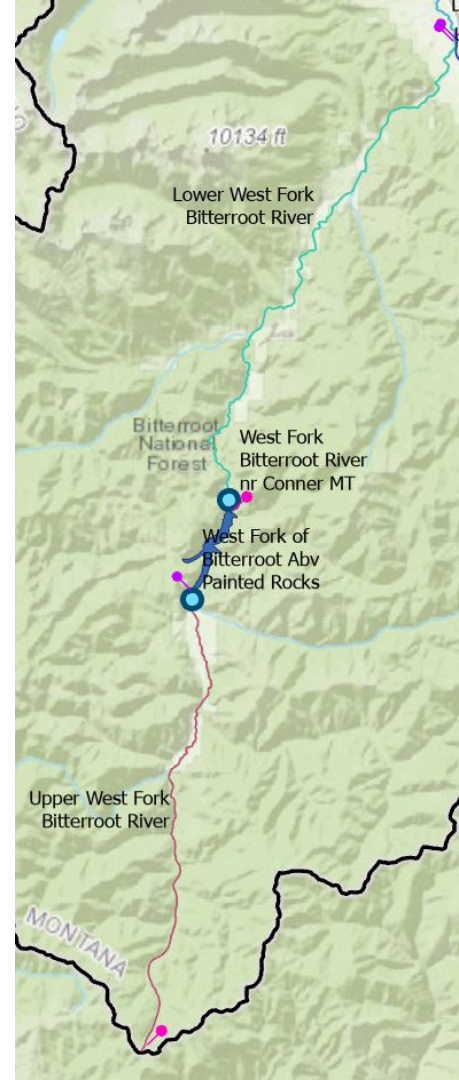
Note: Other Gages appear to be Real-time

West Fork Bitterroot River

Plan to have 2 sections for above and below
“Painted Rocks” Lake

- USGS Gage: West Fork Bitterroot River nr Conner MT
- DNRC Gage: West Fork of Bitterroot Abv Painted Rocks

Note: East Fork doesn't appear to have a real time gage (does have partial at Laird Creek nr Sula)



Group Discussion

1. Other Layers (i.e., impaired waterbodies - DEQ, etc.)
2. Monitoring location
3. Other data integration (i.e., FWP fish survey database)
4. Reservoir Levels (Painted Rocks, Lake Como)