To: Bill Schenk, Adam Strainer

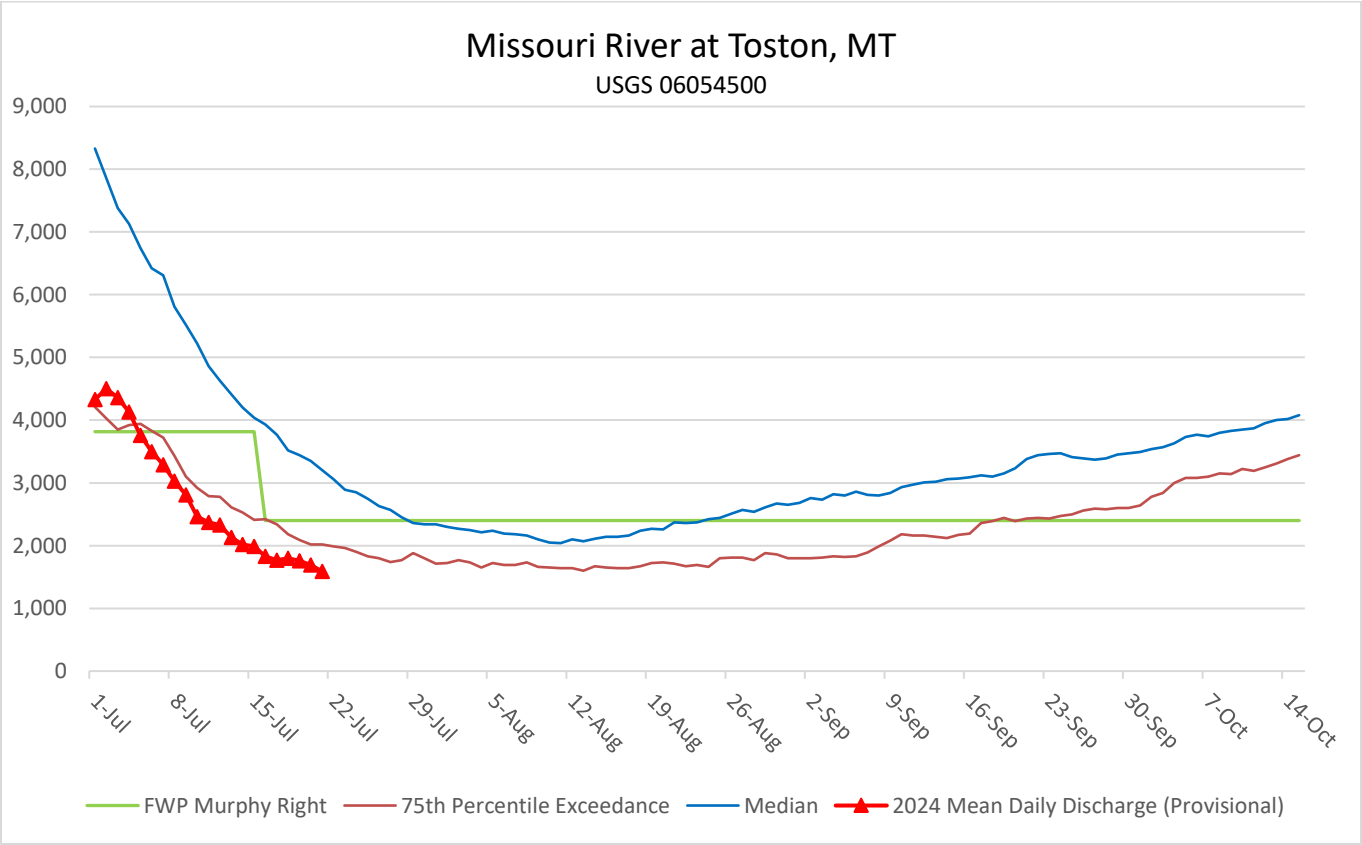
C: Adam Pankratz, Mike Duncan, Amy Groen, Andy Brummond, Greg Lemmon

From: Stephen Begley, FWP Water Program
Ron Spoon, Upper Missouri River Area Fisheries Management Biologist
Matt Jaeger, Hydropower, Native Species & Beaverhead-Ruby Program Manager

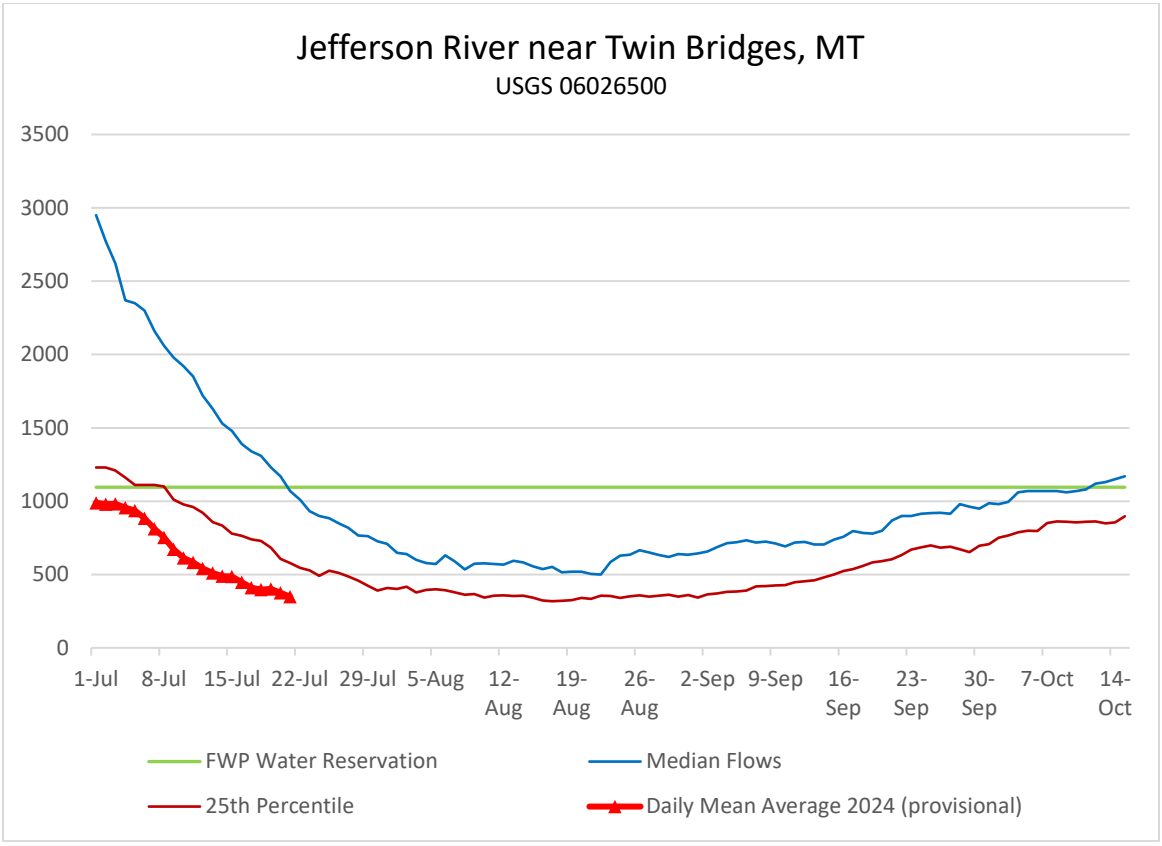
Date: July 23, 2024

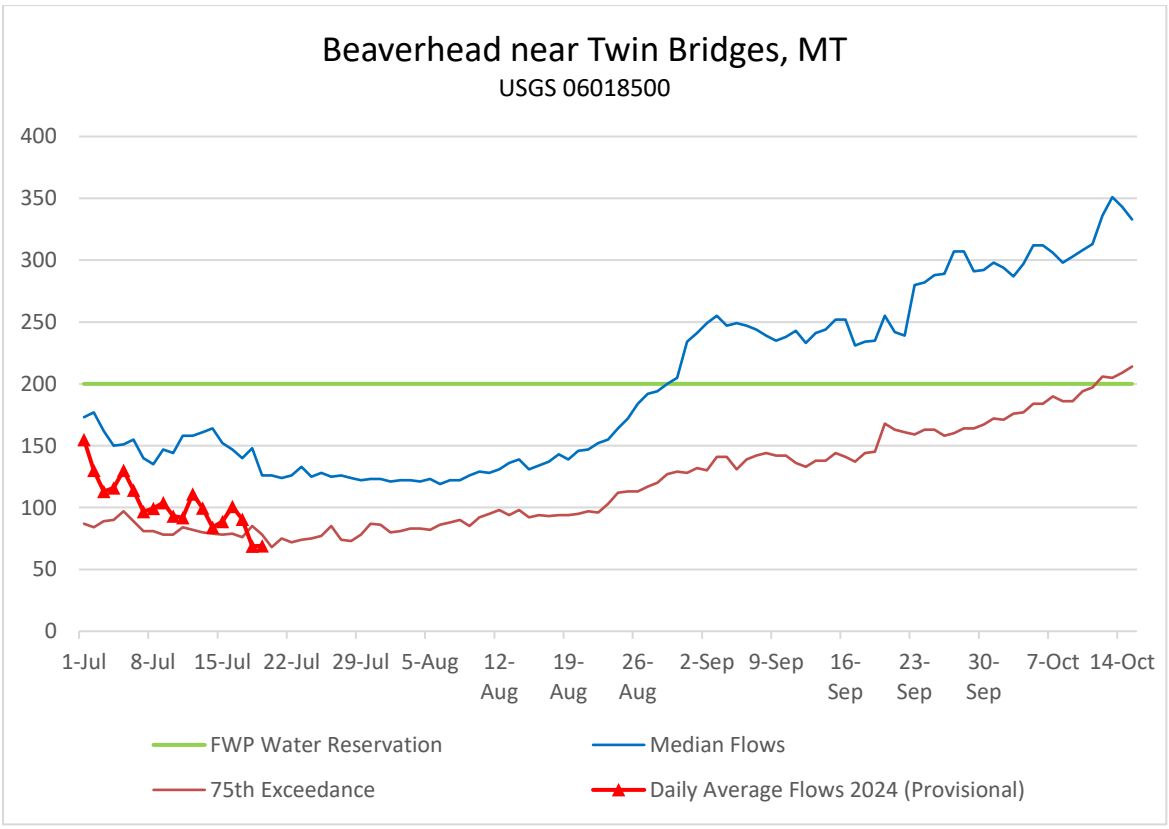
Subject: Call Recommendation on Juniors to the Missouri River Murphy Right in the mainstem and tributaries of the Missouri, Jefferson and Beaverhead Rivers.

Fisheries and Water Program staff have monitored flow and water temperature in the mainstem and tributaries of the Missouri, Jefferson and Beaverhead Rivers and consulted on river conditions and potential merits of placing call on junior water uses. As a result of below average snowpack over the winter months and a drier than average spring, flows in the Missouri, Jefferson and Beaverhead Rivers are well below average for this time of year. Daily average stream flow is well below FWPs Murphy Right of 2,400 cfs. The hydrograph below shows current flow as compared to both the 75th percentile exceedance flow (level met or exceeded 7 out of 10 years) and median flows for the USGS gage near Toston (90-year period of record).



Flows in the Jefferson and Beaverhead are also well below FWPs Water Reservations for this time of year.

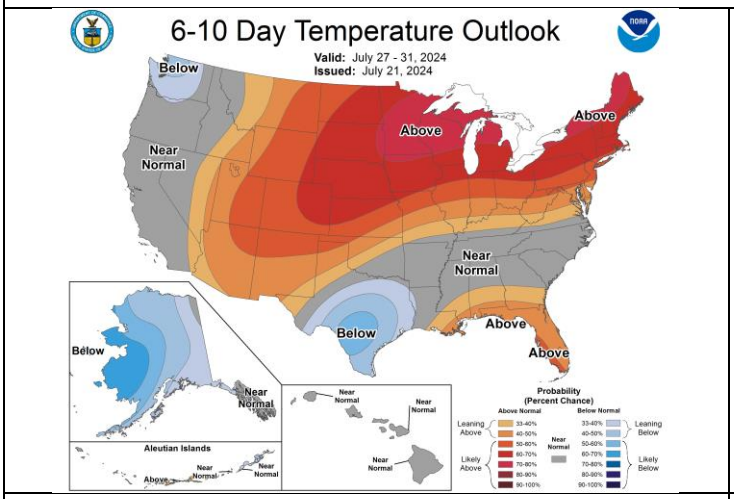


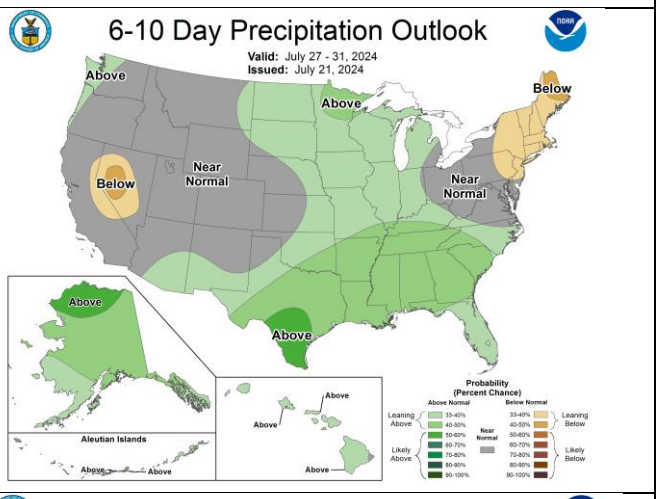


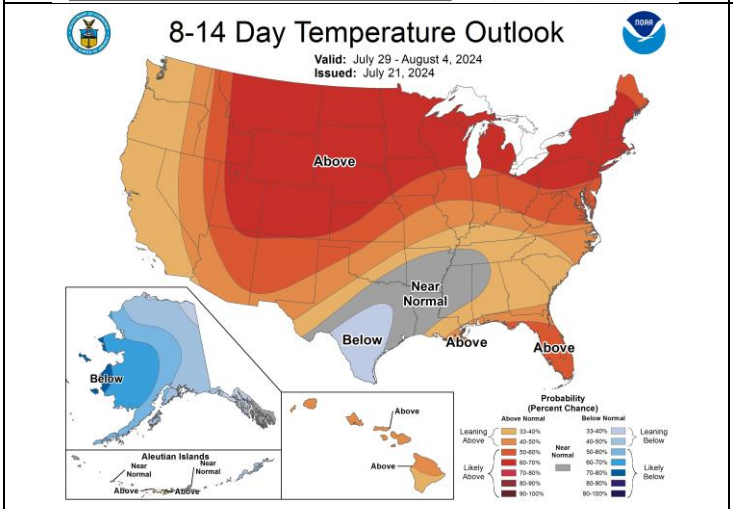
The short term and long-term forecasts for temperature and precipitation are consistent (graphics below). The climate forecast for the 6–14 Day periods indicate a 50-80 percent chance of being above normal

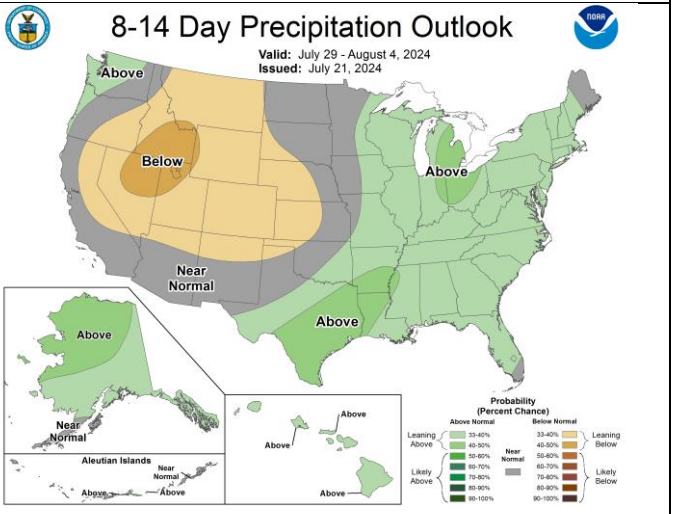
temperature with precipitation ranging between near normal to a 40 percent chance of below normal. The Monthly Temperature and Precipitation Outlooks for July show greater chances for above normal temperatures and below average precipitation. July and August are two of the warmer and drier months in terms of climatological trends. FWP expects that stream flows will not meet FWP's instream flow rights well into the fall without some substantial help from large and significant precipitation events.

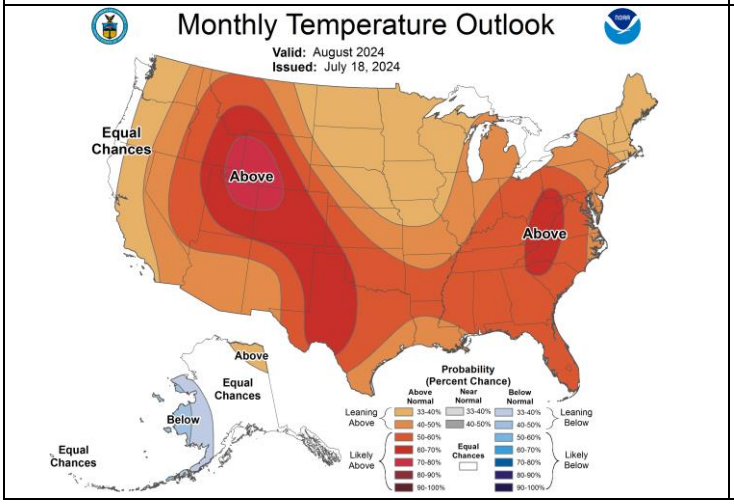
Climate Outlook

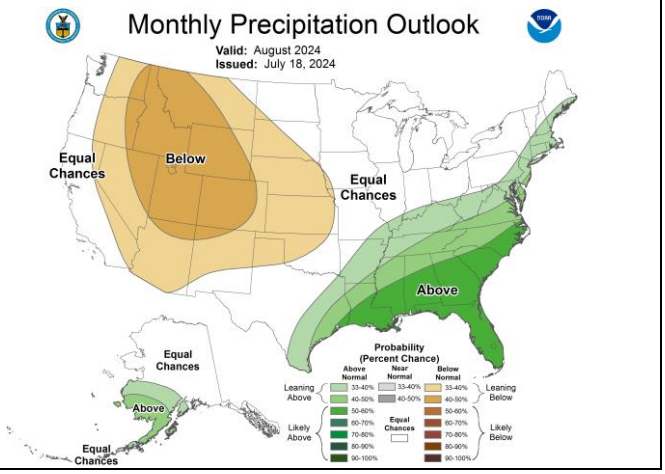








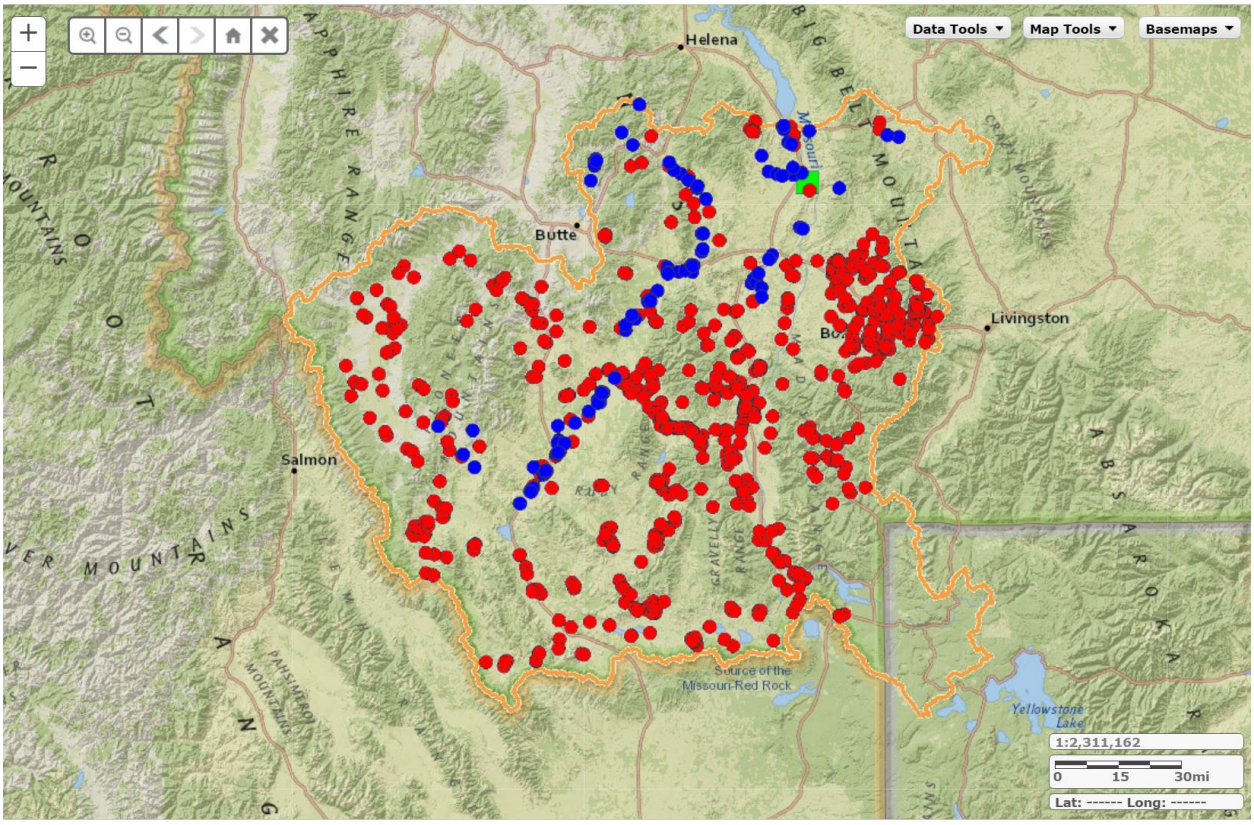




A review of DNRC's water rights database includes a list of 107 junior water rights in the four basins recommended for call. Each of the water rights were reviewed to determine if cessation of water use would likely result in additional flow reaching the Missouri, Jefferson and Beaverhead Rivers, resulting in the following recommendation:

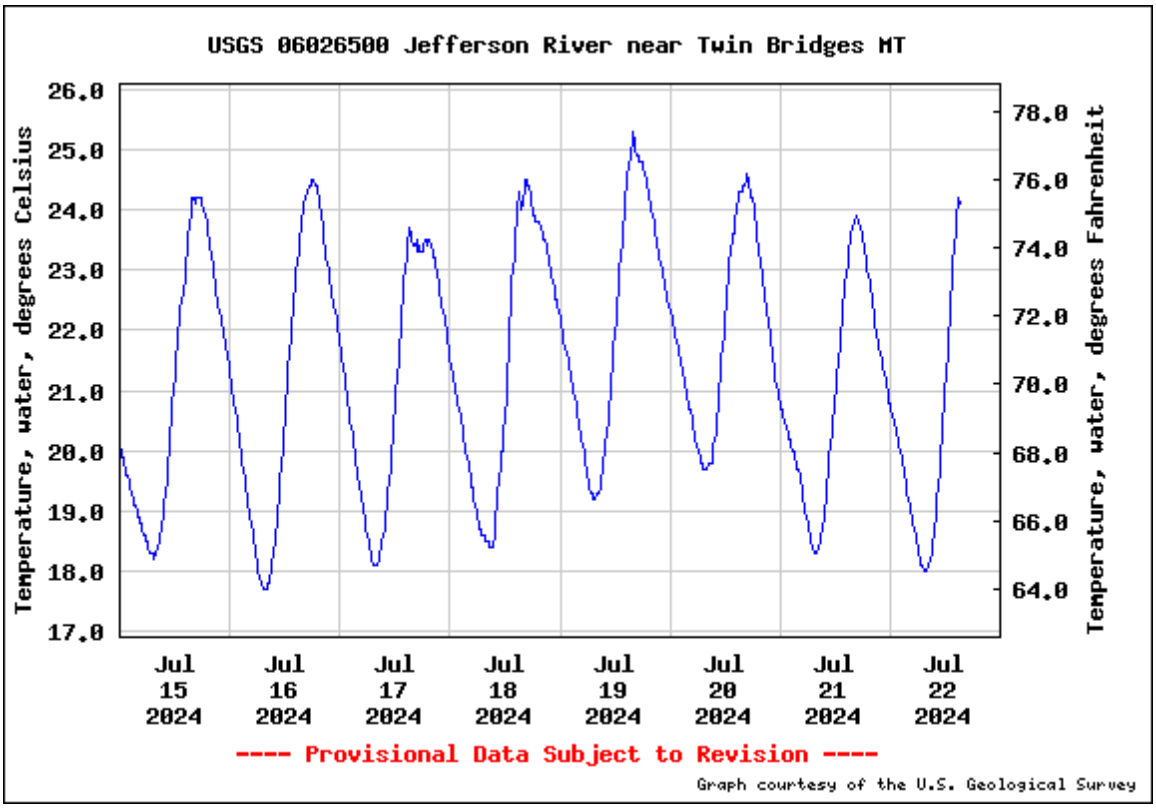
Missouri River Basin Mainstem				
	Purpose(s)	***Call***	***No Call***	***Flow Rate (cfs)***
	Irrigation	22	4	77.49
	Lawn and Garden	2		0.06
	Fish, Wildlife and Recreation	4		4
	Lawn and Garden		1	
	Industrial		1	
	Subtotal:	28	6	81.55
Jefferson River Basin				
Beaverhead	Irrigation	21	15	47.91
	Lawn and Garden	2		.08
	Mining	1		.62
	Commercial		1	
	Fish and Wildlife/Recreation	9	4	6.09
	Subtotal:	*33*	*20*	*54.70*
Boulder	Irrigation	11	2	30.35
	Industrial	1		1.11
	Mining	4	2	1.37
	Subtotal:	*16*	*4*	*32.83*
Mainstem	Irrigation	27	13	55.29
	Lawn and Garden	2		0.11
	Recreation	1	1	0.5
	Mining	1	1	0.37
	Subtotal:	*31*	*15*	*56.27*
	Total:	**108**	**45**	**192.5 cfs**

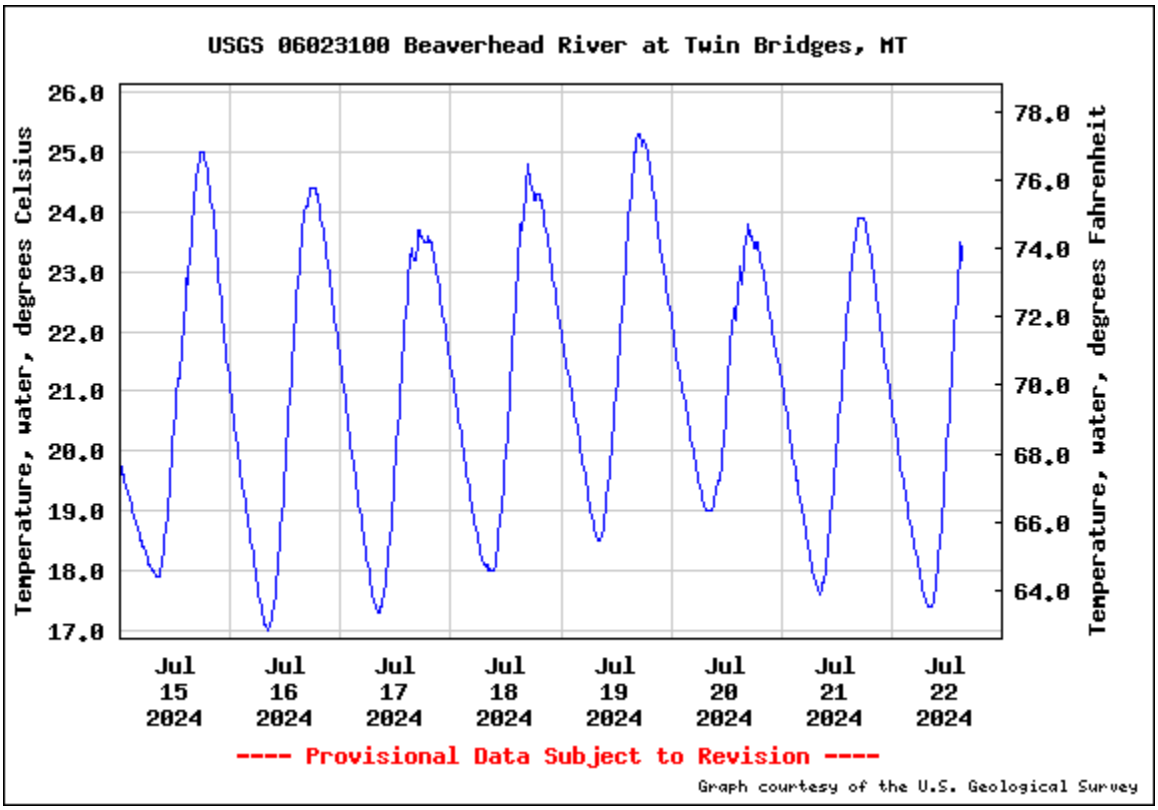
The following map shows the location of all junior water rights. Those represented by blue dots would be called while those represented by red dots would not because of the low likelihood of improving flow in the river. The green square is the location of USGS Gage 06054500 on the Missouri River at Toston, MT.



Water Temperature and Fisheries Concerns

The headwaters of the Jefferson and Missouri watersheds (Beaverhead, Jefferson, Boulder, Missouri Rivers) hold important habitat for trout fisheries in Southwest Montana. Dewatering and associated warm water temperatures can negatively impact fish populations in these rivers and associated tributaries. High-water temperatures and fragmented habitat can also increase stress, vulnerability to predation, disease development and generally increase mortality rate. During high temperature periods, higher streamflow can counteract the effects of high temperature and improve fish survival by moderating water temperature, reducing competition, providing more deep pool habitat where fish can avoid higher water temperatures, and increasing connectivity to enable migrations to more suitable habitats. Maximum daily water temperature for each of these systems has exceeded 73 F and resulted in fishing prohibition after 2 pm in the Beaverhead and Jefferson Rivers.


USGS 06026500 Jefferson River near Twin Bridges MT
Temperature, water, degrees Celsius
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
Temperature, water, degrees Fahrenheit
78.0
76.0
74.0
72.0
70.0
68.0
66.0
64.0
Jul 15 2024
Jul 16 2024
Jul 17 2024
Jul 18 2024
Jul 19 2024
Jul 20 2024
Jul 21 2024
Jul 22 2024
---- Provisional Data Subject to Revision ----
Graph courtesy of the U.S. Geological Survey


USGS 06023100 Beaverhead River at Twin Bridges, MT
Temperature, water, degrees Celsius
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
18.0
17.0
Temperature, water, degrees Fahrenheit
78.0
76.0
74.0
72.0
70.0
68.0
66.0
64.0
Jul 15 2024
Jul 16 2024
Jul 17 2024
Jul 18 2024
Jul 19 2024
Jul 20 2024
Jul 21 2024
Jul 22 2024
---- Provisional Data Subject to Revision ----
Graph courtesy of the U.S. Geological Survey

At this time, we recommend making call on junior users of the Beaverhead, Jefferson, Boulder, and Mainstem Missouri River above Canyon Ferry Reservoir.