



MEMORANDUM

To: Bill Schenk, Trevor Watson

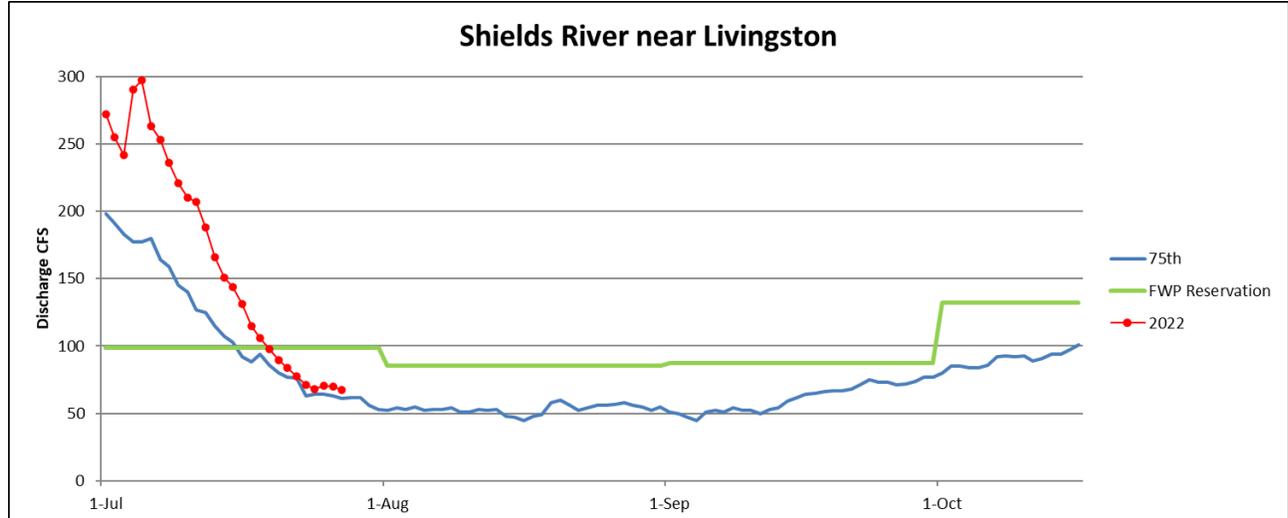
C: Marina Yoshioka, Jim Olsen, Amy Groen, Stephen Begley

From: Andy Brummond, FWP Water Program
Scott Opitz, Livingston Area Fisheries Management Biologist

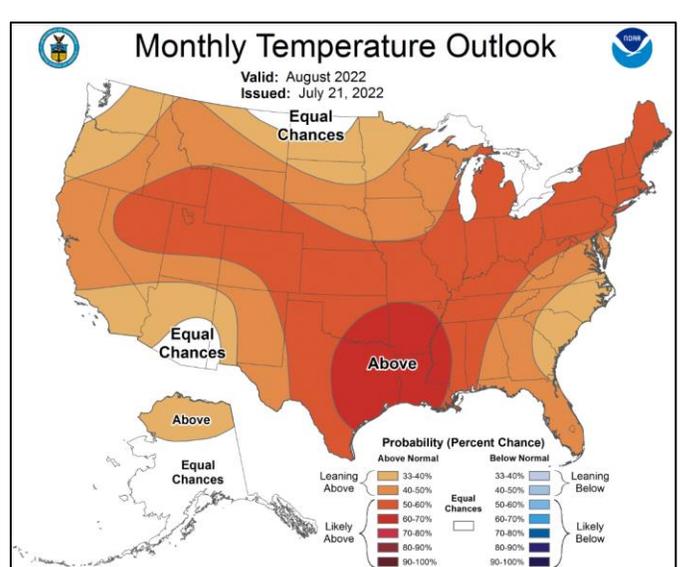
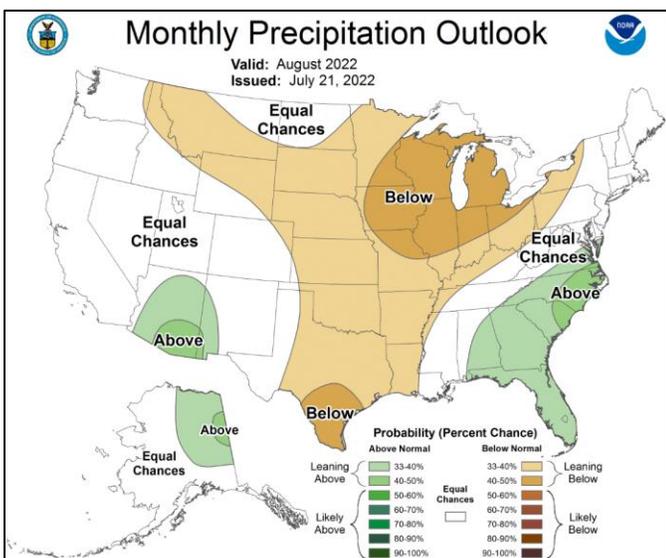
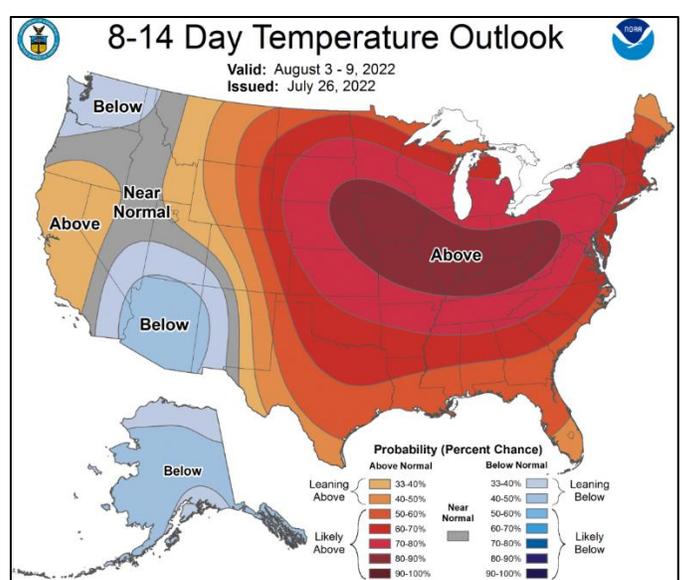
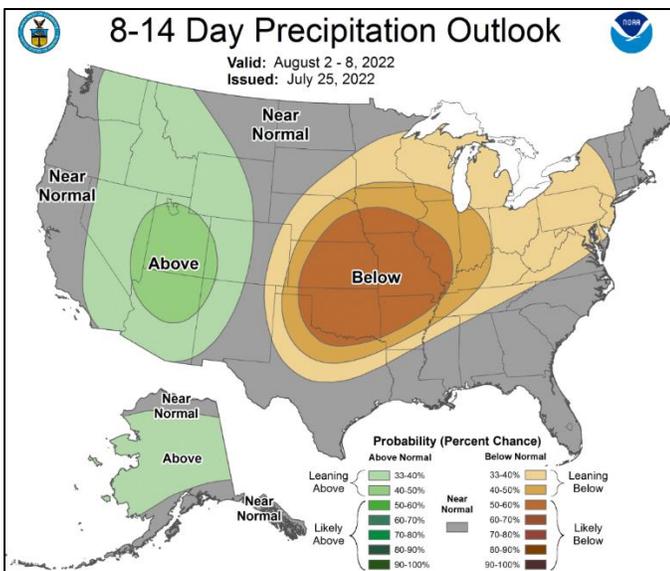
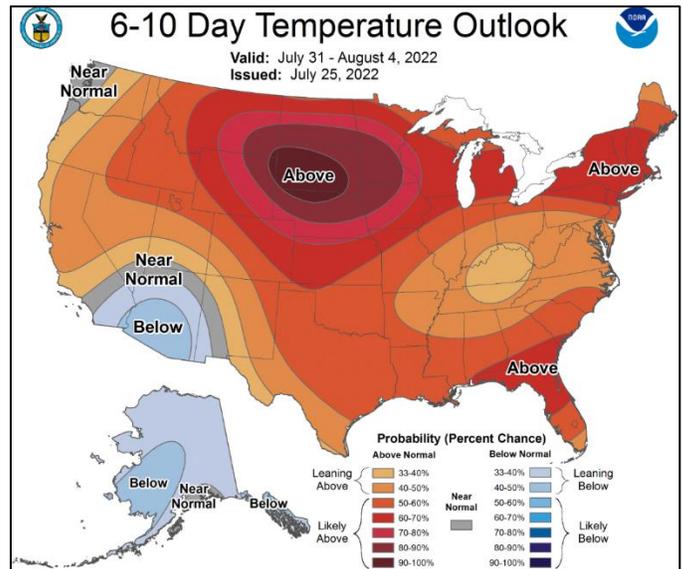
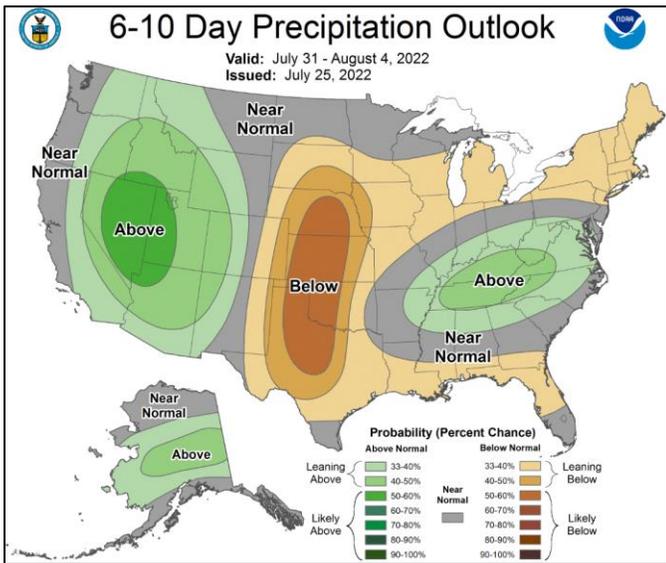
Date: July 28, 2022

Subject: Shields River – Call on Junior Water Rights

Fisheries and Water Program staff have monitored flow and water temperature in the Shields River and consulted on river conditions and potential merits of placing call on junior water uses. We jointly recommend that FWP make call on the Shields River. Stream flow in the Shields River has dropped well below FWP's instream water reservation. The hydrograph below shows that flow is near the 75th percentile exceedance flow (level met or exceeded 3 out of 4 years) for the USGS gage near Livingston (44-year period of record).



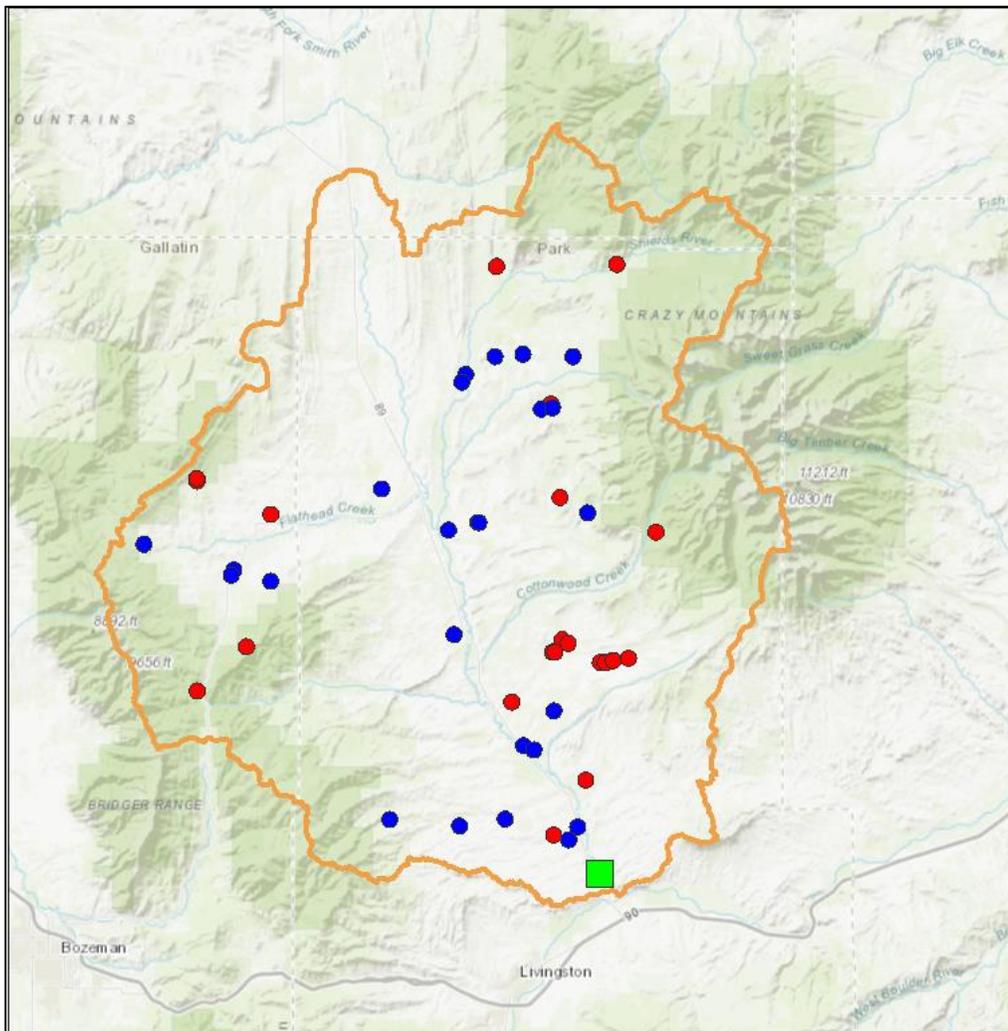
The 6-10 and 8-14-day precipitation outlooks lean towards above normal precipitation while the August monthly outlook leans towards below normal precipitation overall for the month (graphics attached). However, normal precipitation for this time of year is relatively light overall so increased chances of precipitation do not necessarily translate to improved stream flow. Temperatures for all three reporting periods point toward above normal temperatures. Given expected weather conditions and high demand for irrigation water, streamflow would not be expected to again meet FWP's instream flow rights into the fall without significant precipitation events.



DNRC's water rights database includes 43 junior water rights in the Shields River basin. Each water right was reviewed to determine if cessation of diversion would likely result in additional flow reaching the Shields River. The following table lists the water rights by general purpose category.

Purpose	Call	No Call	Total Called Flow Rate
Fish, Wildlife, Recreation Ponds	12	14	5.76 cfs
Irrigation	13	1	16.45 cfs
Stock	0	3	-
Total	25	18	22.21 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 06195600.



The Shields River basin holds a relatively intact distribution of Yellowstone cutthroat trout. Dewatering and associated warm water temperatures negatively impact the fishery of the basin with high-water temperatures and fragmented habitat increasing stress and mortality. During high temperature periods, higher streamflow can counteract the effects of high temperature and improve fish survival by moderating water temperature and providing more deep pool habitat where fish can avoid higher water temperatures. The chart below shows maximum daily water temperatures at Convict Grade Road near the mouth of the Shields exceeding 73°F for three days before receding some. With higher temperatures forecasted, maximum daily water temperatures are again expected to exceed 73°F.

