

# **Colorado River Storage Project Flaming Gorge Working Group Meeting Minutes August 20, 2020**

## **Participation**

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This meeting was held Thursday, August 20, 2020 from 10:00 am to 12:00 noon. Due to the ongoing COVID-19 (Coronavirus) pandemic, the meeting was held via WebEx virtual meeting. Attendees are listed below.

## **Purpose of Meeting**

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The purpose of these working group meetings is to inform the public and other interested parties of Reclamation's current and future operational plans and to gather information from the public regarding specific resources associated with Flaming Gorge Reservoir and the river corridor below it. In addition, the meetings are used to coordinate activities and exchange information among agencies, water users, and other interested parties concerning the Green River.

## **General**

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Dale Hamilton (USBR) called the meeting to order at 10:00 a.m. and introduced the meeting agenda and presenters: Brenda Alcorn, Tildon Jones, Nathaniel Todea, and George Weekley. To avoid audio feedback, attendees were asked to introduce themselves via the chat function in the virtual meeting (attendees who identified themselves or were identifiable by their meeting attendee name were included in the list of attendees below).

On August 17, Dale sent out an email notification that Western Area Power Administration (WAPA) had alerted Reclamation of an increased possibility of calling to increase power production at Flaming Gorge and turned some time to Jerry Wilhite (WAPA) to briefly describe the situation. The western United States has been, and currently is, experiencing extremely high temperatures which are resulting in increased power demand to run air conditioners/fans/coolers which may lead to power shortages. Flaming Gorge may be called upon to increase power production to meet system demands. As temperatures cool the likelihood of calling on Flaming Gorge decreases.

## **Green and Yampa Rivers: Spring Forecast and Runoff Review – Brenda Alcorn**

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Brenda Alcorn, Senior Hydrologist, National Weather Service, Colorado Basin River Forecast Center

Brenda presented information on past weather, snow, and runoff conditions, and upcoming weather.

Precipitation for October thru March was near average (95% of average) in the Upper Green River basin overall (but variable across the basin) and average (100% of average) in the Yampa basin. April thru July Upper Green River basin precipitation was higher above Fontenelle than below (a reversal of the October thru March pattern), and low in the Yampa basin, resulting in October thru July precipitation being below average in the Upper Green River basin (90% of average overall, 95% of average above Fontenelle) and in the Yampa basin (90% of average). In general, since March conditions have worsened across the entire Upper Colorado River Basin, except for the Upper Green headwaters above Fontenelle.

Temperatures were slightly below normal in April on average, but there was significant warming (10-20 degrees above normal) during the last week of the month. The end of May and start of June was also unusually warm for seven to ten days.

Upper Green River basin snowpack peaked slightly above normal at mid-elevation (8,000-9,000 feet) SNOTEL sites, but was slightly below normal at higher elevations (10,000-13,000 feet). The runoff pattern in the upper part of the basin fluctuated around normal early but trended below normal after mid-June. Water supply forecasts for Flaming Gorge were steady (85-90% of average), and close to the volume we received (85% of average), all year with the exception of the low June 1 forecast (76% of average).

Yampa basin snowpack, like Green River snowpack, was slightly above normal at mid-elevation and slightly below normal at higher elevations. The runoff peak occurred early this year (May 5) and was followed by multiple lower peaks into the first half of June. Flows have been below normal since mid-June. Water supply forecasts for the Yampa River at Deerlodge Park were more variable and steadily decreased from April (110% of average) to July (91% of average) with the below normal precipitation. After near normal river flows through the first half of the runoff season, conditions got extremely dry. July and August-to-date precipitation have been very low. Very little runoff water came after mid-June. July flows were near the 25<sup>th</sup> percentile and August flows decreased even more and are now near the 10<sup>th</sup> percentile.

In summary, the Flaming Gorge April-July unregulated runoff was 85% of the 1981-2010 average and the CBRFC forecast model performed well this season. The Yampa April-July runoff volume was 90% of the 1981-2010 average; after early season conditions hinted at an above average year, below average precipitation each month from March onward brought a different reality: normal early runoff but a below normal second half of the runoff.

Looking ahead, in the short term, it looks like hot dry weather will remain for the immediate future, however, models are indicating that the high-pressure system near the four corners region may begin to move east towards the end of the month. In the long term, there is a La Nina watch with a ~60% chance of La Nina development and continuing through the winter; La Nina events have a weak correlation to increased winter precipitation in the Upper Green.

### Recovery Program 2020 Green River Flows – Tildon Jones

Tildon Jones, U. S. Fish & Wildlife Service, Upper Colorado River Endangered Fish Recovery Program

Tildon presented information on the listed fish and Recovery Program, spring operations, summer base flows, and future flow proposals.

There are four endangered fish in the Colorado River that are all native to the basin and found nowhere else: Colorado pikeminnow (*Ptychocheilus lucius*), Razorback sucker (*Xyrauchen texanus*), Bonytail (*Gila elegans*), and Humpback chub (*Gila cypha*). The Upper Colorado River Endangered Fish Recovery Program was established in 1988 among a number of partners to recover the endangered fish while water development proceeds by balancing Endangered Species Act compliance with the Law of the River. The Recovery Program provides Endangered Species Act compliance in a holistic way instead of individual entities being required to manage recovery efforts in smaller areas. There are five recovery elements: Habitat/Flow Management, Habitat Development, Stocking Endangered Fish, Managing Nonnative Fish, and Research and Monitoring. Flow management occurs throughout the Upper Colorado River Basin—Flaming Gorge is one of six points of flow control in the basin. Different parts of the runoff hydrograph

provide different benefits: substrate cleansing, sand transport, and migration cues as flows rise; floodplain access and channel maintenance as flows peak; spawning and emergence as flows reside; and early growth and survival as flows are low.

The Recovery Program's 2020 flow request was that Reclamation exercise the flexibility granted in the 2006 Record of Decision to achieve preferred summer base flow range targets at the correct time, hit larval trigger study plan spring operation targets, and the request expressed the desire to in the future conduct flow spike experiments to disadvantage smallmouth bass reproduction in Green River reaches 1 and 2.

The spring operations requests are based on floodplain wetlands being a better environment for larvae (especially larval razorback sucker) than the main river channel (the intent of the 2000 flow recommendations and 2006 Record of Decision was to get fish into the wetlands). The floodplains: connect to the river at higher flows; have warm, deep (3+ feet) water with no current; and are screened to keep out nonnatives with controlled flow in and out. Before the Larval Trigger Study Plan (LTSP), Flaming Gorge peak releases were timed to match Yampa River peak flows which typically occur prior to larvae emergence and don't allow for larvae to enter the floodplains. The Larval Trigger Study Plan shifted Flaming Gorge peak releases to match fish presence and allow for larvae to enter the floodplains.

In 2019, the river was high enough to connect to seven floodplain/wetland sites all of which had razorback suckers in them, 650+ juveniles were captured mostly from Old Charley and Stewart Lake areas, additional wetlands were not drained this year and had juveniles present that had survived the winter.

In 2020, larvae were detected on May 19 and dam releases were increased beginning on May 26. Based on the average (below median) hydrologic condition at the time, the target releases were 14,000 cfs with a peak of 18,600 cfs and actual reservoir releases peaked at 18,300 cfs on June 4. The river connected to Stewart Lake, Johnson Bottom, Sheppard Bottom, Old Charley, and Above Brennan floodplain/wetland areas, and made brief connections to Stirrup and Leota Bottom. Juveniles were confirmed at Johnson and Old Charley.

Base flow requests are made with the goal of improving the survival and recruitment of young Colorado pikeminnow by timing base flows for when pikeminnow emerge; improved numbers of juveniles have been shown at flows of 1,700-3,000 cfs at Jensen.

In 2020, Colorado Pikeminnow larvae were detected on June 28 and flows were already in the recommended (1,700-3,000 cfs) range for first detection. For the average (below median) hydrologic condition, the recommended range is 2,000-2,600 cfs, we're targeting 2,000 cfs.

In the future (as early as 2021 if the timing of approvals and hydrologic conditions allow but most likely 2022 or later) a request will be made to experiment with a flow spike to reduce nonnative smallmouth bass spawning. Addressing nonnative fish generally requires significant resources, but a flow spike may have river-wide effects due to smallmouth bass nests, eggs, and larvae being susceptible to increased river currents. It is anticipated that the request will be for approximately three days at Flaming Gorge powerplant capacity releases (~4,600 cfs).

There have been some site visits to floodplain/wetland areas in the past and may be additional visits in the future. If anyone is interested in future site visits to existing and potential sites of future wetland areas let Tildon or Dale know.

## Flaming Gorge Hydrology & Observed/Forecasted Operations – Nathaniel Todea

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Nathaniel Todea, Hydraulic Engineer, U. S. Bureau of Reclamation

Nathaniel presented information on Flaming Gorge and the Colorado River Storage Project, base operations, 2020 forecasted hydrology, and 2020-2021 reservoir operations.

The 1956 Colorado River Storage Project authorized construction of Flaming Gorge Dam and other projects for: allowing Upper Basin States to utilize their 1922 Colorado River Compact apportionments, regulating Colorado River (and main tributaries) flow, storing water for beneficial consumptive use, reclamation of arid and semiarid lands, flood control, and hydroelectric power generation.

For operations, the Green River below Flaming Gorge is divided into three reaches: Reach 1 from Flaming Gorge Dam to the Yampa River confluence, Reach 2 from the Yampa River confluence to the White River confluence, and Reach 3 from the White River confluence to the confluence with the Colorado River.

Snowpack above Flaming Gorge (average of 21 SNOTEL sites) peaked at 17 inches of snow water equivalent on April 19, which is 113% of the median peak. Flaming Gorge Reservoir observed unregulated April-July inflow reported by the Colorado Basin River Forecast Center was 833,000 acre-feet which is 90% of average and ~100% of median.

Snowpack in the upper Yampa and White River basins (average of 20 SNOTEL sites) peaked at 23.8 inches, which is 110% of median. Yampa at Deerlodge Park observed unregulated April-July flow reported by the CBRFC was ~1,120,000 acre-feet which is 90% of average and 95% of median. The Yampa River runoff peak flow came much earlier than anticipated.

Peak Flows: Based on the May 1<sup>st</sup> runoff forecast being in the average (below median) hydrologic condition, the Larval Trigger Study Plan suggested Reach 2 flows in the range of 14,000 to 18,600 cfs for between 7 and 14 days to activate the Stewart Lake, Above Brennan, Old Charley Wash, Escalante Ranch, Bonanza Bridge, Johnson Bottom, Stirrup, and Leota 7 wetlands. Actual flows in Reach 2 were in the 14,000 to 18,600 range for 12 days and peaked at 17,600 cfs on June 4, with releases from Flaming Gorge being held at power plant capacity (~4,600 cfs) for 13 days.

Base Flows: For this year's average hydrologic classification, base flows of ~2,000 cfs were targeted.

Operations have been according to average classification guidance, however, conditions may drop to moderately dry in which case operations would be adjusted.

The Larval Trigger Study Plan calls for three years with flows below and three with flows above 18,600 cfs for at least seven days. This year was another below 18,600 cfs year, our sixth year since 2012. We're still looking to get a third year with above 18,600 cfs flows for seven or more days.

Looking at current and future 2020 operations: the Larval Trigger Study Plan peak flows are complete, summer base flows for Colorado pikeminnow (July to end of September) are currently happening, Utah fish monitoring will occur September 1-2, autumn base flows (10/-11/30) will be ~1100 cfs, winter base flows (12/1-2/28) will be ~920 cfs, and transition period (3/1-4/30) flows will be dependent on hydrologic classification to hit the 5/1 target reservoir elevation.

## Green River Flows: How Flaming Gorge Dam operations benefit trout and endangered fish – George Weekley

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George Weekley, Fisheries Biologist, U. S. Fish & Wildlife Service, Utah Field Office

George presented information on the history of Flaming Gorge Dam and its operations, and how they affect the fishery below the dam.

Below Flaming Gorge Dam, the Green River Reach 1 (Flaming Gorge Dam to Yampa River, ~65 miles) has trout to Browns Park and adult Colorado pikeminnow in Lodore; Reach 2 (Yampa to White River, ~100 miles) has Razorback sucker spawning, and Razorback sucker and Colorado pikeminnow nursery habitat; Reach 3 (White to Colorado River, ~245 miles) has Humpback chub in Desolation and Gray canyons, Colorado pikeminnow spawning, and Razorback sucker and Colorado pikeminnow nursery habitat.

Flaming Gorge was authorized under the Colorado River Storage Project Act (1956) and constructed from 1956 to 1963. In the 1960s and 1970s, dam operations focused on power generation, with very minimal instream flow during the winter and massive daily flow fluctuations (often from ~900 to 2400 cfs daily). In the mid-1970s, fisheries managers noticed that dam operations for power affected fish (trout, endangered fish, and macroinvertebrates downstream), and in the late 1970s, the selective withdrawal structure was put in place to regulate release temperatures. In 1980 an informal agreement set minimum releases to 500 cfs. The 1992 Biological Opinion set experimental flow releases to study impacts (beneficial and adverse) throughout the basin. In the mid-1990s experimental flows were implemented.

The 2000 Muth et al. Flow and Temperature Recommendations fed into the 2006 Record of Decision and set minimum baseflow for dam releases and recommended no more than 40% change in summer baseflows and no more than 25% change in winter baseflows. For spring peaks, the importance of 18,600 cfs in Reach 2 in average or wetter years, and dam releases timed to match the peak or immediate post-peak of the Yampa River (with flexibility) were addressed. Dam releases are now being timed to coincide with razorback sucker larvae to allow for connection to floodplain nursery areas.

Peak flows benefit the fishery. Data from USU and UDWR show that higher peak flows increased the diversity and abundance of macroinvertebrates. During initial high flows, the density of drifting macroinvertebrates increases and trout feed during those conditions. Modeling shows macroinvertebrate density is greatest predictor of trout abundance and condition, not flow. The highest macroinvertebrate densities have all occurred since the start of the LTSP in 2012.

Base flows benefit the fishery. Consistent summer base flows provide certainty in water conditions for floating, allow for higher average flows during dry years and lower average flows during wet years, and reduce the daily fluctuations from hydropower operations due to a more consistent flow for power generation.

### General Discussion, Comments, Questions

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Dale opened the meeting for any discussion, comments, or questions. No discussion items, comments, or questions were brought up.

### Next Meeting

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- Thursday, March 18, 2021 in Price, UT (tentative)
- Thursday, April 15, 2021 in Vernal, UT (tentative)
- Thursday, August 26, 2021 in Price, UT (tentative)

## Attendees

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Hattie Johnson	American Whitewater	Trina Hendrick	Utah DWR
Woody Bair	Flaming Gorge Resort	Ryan Mosley	Utah DWR, Dutch John
Boyd Kitchen	Utah State University	Paul Thompson	Utah DNR
Christy Leonard	Utah State University	Chris Keleher	Utah DNR
Bart Leeftang	CUWCD	Darrell Gillman	Utah DAF
Melissa Trammell	NPS	Namratha Nallappan	Utah DWRi
Gene Seagle	NPS	Dale Hamilton	USBR
Terry Fisk	NPS (Canyonlands NP)	Dave Speas	USBR
Paul Scolari	NPS (Dinosaur NM)	Erik Knight	USBR
Brenda Alcorn	NWS (CBRFC)	Gary Henrie	USBR
Tildon Jones	USFWS	John Morton	USBR
Tom Chart	USFWS	Mark Delorey	USBR
George Weekley	USFWS	Nathaniel Todea	USBR
Kevin McAbee	USFWS	Paul Davidson	USBR
Don Anderson	USFWS	Preston Feltrop	USBR
Derek Fryer	WAPA	Ryan Christianson	USBR
Jerry Wilhite	WAPA	Scott Elliott	USBR
Lowell Marthe	Utah DWR	Susan Behery	USBR