

Colorado River Storage Project

Fontenelle Working Group

Meeting Minutes

August 20, 2014

PARTICIPATION

This meeting was held August 20th, 2014 at the Jim Bridger Power Plant in Rock Springs, Wyoming.

PURPOSE OF MEETING

The purpose of working group meetings (held in April, and August) 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 Fontenelle Reservoir. In addition, the meetings are used to coordinate activities and exchange information among agencies, water users, and other interested parties concerning the Green River.

MEETING OVERVIEW

Heather Patno (USBR) called the meeting to order shortly after 10:00 a.m. Presentations were given in the following order: Ashley Nielson, the National Weather Service Colorado River Forecast Center (CBRFC) followed by Heather Patno, Bureau of Reclamation. Before starting, all present introduced themselves and their affiliations.

FORECAST PRESENTATION – ASHLEY NIELSON

Ashley Nielson with the Colorado River Basin Forecast Center (CBRFC) in Salt Lake City provided a review of WY 2014 weather patterns in addition to characterizing spring snow pack conditions. She then described spring and summer streamflows and discussed the April-July runoff forecast performance for the Green River Basin above Fontenelle. Finally, she briefly discussed long term projections and guidance related to WY 2015.

Weather Review (Fall + Winter)

The Green River Basin above Flaming Gorge received above average precipitation in most fall and winter months, including September (220% of average), October (145% of average), December (130% of average), February (220% of average), and March (120% of average). During February, in particular, very moist and mild air was transported into the Western United States. This “atmospheric river” produced significant precipitation in the Green River Basin of Wyoming and in the northern Bear River Basin. This resulted in above or much above average precipitation in the Yampa, Colorado Headwaters, and Upper Gunnison. Several sites reported 300-400% of average monthly precipitation. In many cases, this amounted to the 2nd highest February precipitation for the period of record.

Late spring and summer months were somewhat drier, with only July (110% of average) and August being above average. Seasonal precipitation through May (i.e. Oct 2013 – May 2014) was at or above average (90-130%) throughout the basin.

In general, spring was characterized by near normal temperatures with occasional interruptions of a few days with above or below average temperatures. Snowmelt was initiated by stretch of above average temperatures in mid-April, and runoff peaked during a warm period at the end of May. However, temperatures returned to normal in early June, and spring runoff was interrupted by a cold storm system that arrived in mid-June.

Snow Conditions

Snow conditions were consistent with the 30-year average through the end of January. However, above average precipitation in February resulted in much above average snow water equivalent (SWE) for the season. The Snotel group representing the Green River Basin above Fontenelle peaked at 24.4 inches, or 162% of the 30-year (1981-2010) median seasonal peak (15.1 inches), during the first week of April (04/05/14). By June 1st, only high elevation snow remained in the basin. Snowmelt was largely complete by July 1st.

Streamflows

Streamflows peaked during the first week of June. The Green, Yampa, and Colorado Rivers all peaked at roughly the same time, which is unusual. Flows were above to well above average throughout the water supply period from April through July.

Water Supply Volume Forecast Review

As of February 1st, the CBRFC's official forecast of seasonal water supply volume was consistent with the 30-year median. However, the forecast increased substantially in March, due to abundant precipitation received in February. The April 1st most probable (50% exceedance probability) water supply volume forecast for the Green River at Fontenelle (GBRW4) amounted to 1,210 KAF, or 167% of average. The May and June forecasts were identical at 1130 KAF, or 156% of average.

The observed WY 2014 runoff volume amounted to 1,020 KAF, or 141% of average. It was noted that the CBRFC's April and May forecasts tend to underestimate seasonal flow volumes in "wet" years, but this was not the case in WY 2014. This may have been due to inconsistent spring temperatures (i.e. a mix of hot and cold weather), which tend to result in inefficient runoff and lower streamflows.

Long Term Weather

While current weather patterns reflect neutral ENSO conditions, several models point to the potential development of El Nino conditions in fall 2014. However, the probability of a strong El Nino developing is decreasing. El Nino conditions generally produce cooler and wetter conditions in the southern U.S., and dryer and warmer conditions in the northern U.S. However, because the Green River Basin above Fontenelle is located between these distinct areas, there is no strong correlation between weather patterns in the region and El Nino conditions.

The 90-day outlook for August, September, and October indicates equal chances for above and below average temperatures and a 30-40% chance for above average precipitation in a portion of the basin. As a result, above average inflows are forecasted for Fontenelle in August (118%), September (129%), and October (113%).

OPERATIONS PRESENTATION – LEE TRAYNHAM

Heather Patno presented the current conditions at Fontenelle Reservoir and described anticipated WY 2014 operations. As of April 22, 2014, Fontenelle Reservoir was 34% full, which correlates to 36.2 ft below maximum reservoir elevation (6506.0 ft). This is typical for the time of year, given the above average runoff forecast. The current release is 1,420 cfs, and the 5-day average inflow is 1,600 cfs.

The operational plan, based on the April forecast of 1,210,000 AF, is to maintain a release of 1,420 cfs through the end of April. Releases would be increased to 4,000 cfs in May, and then increased to 8,000 cfs in June. These flows are significantly higher than the 2013 peak release of 800 cfs. Releases would be reduced to 3,000 cfs in July before returning to an estimated base flow of 1,250 cfs in August or September, where they will remain through fall and winter. Given the April inflow forecast and anticipated operations, Fontenelle Reservoir is expected to peak at full capacity (pool elevation 6506.0 ft) in September 2014.

GENERAL DISCUSSION

Q: During the spill period, was there any concern for flood control given abundant August precipitation and lack of available storage space?

A: Reclamation indicated that flood control was not a concern because excessive inflows would have been released via the 18,000 cfs bypass. This was unnecessary as inflows remained fairly steady around 2,500 cfs.

Q: Was the sediment in the stilling basin removed by the spill?

A: Divers will observe the spillway in September to determine whether or not the spill operation was successful. In early spring 2014, divers estimated roughly 4 ft of sediment deposition in the stilling basin, with greater depths toward the downstream end. During the late July operation, spill was increased until turbulence was observed throughout the stilling basin, suggesting movement of the settled material.

Q: What are critical flow needs for fish habitat?

A: No flow changes would be made prior to April 1st—increased flows can flush young fry from their shallow, protected habitats. Water temperatures in August are key. Flows would be constant from September 1st through end of March, and not below 600 cfs. No adjustment of flow after ice cover. The worst year for trout in memory was 2004, flows reached 400 cfs.

Q: Does Reclamation monitor sediment at the upstream end of the reservoir?

A: No, but turbid lake water was observed in both the fall of 2013 and spring 2014 prior to runoff. The turbidity was likely due to sediment entrained during fall and summer storm events, and a landslide may have also contributed.

Q: Previously, Reclamation has operated Fontenelle to allow at least 3 ft of freeboard, to allow pool elevation to approach the spillway but never spill, and most recently, to spill. Has Reclamation's operational strategy changed over time and is the agency more comfortable with allowing the reservoir to spill?

A: Yes. Following spring runoff, Reclamation would prefer to operate with a full reservoir during the summer. However, Reclamation does not plan to spill the reservoir

every year, as operators would prefer to use the bypass to release summer flood inflows.

There was concern that meeting releases with a large portion of spill (rather than power plant discharge) would increase water temperatures in the river downstream of the dam and result in detrimental impacts to fish. It was not an issue this year as high inflows (2,500 cfs) resulted in reasonable reservoir surface temperatures (~70 deg F). The river temperature downstream of the dam (as measured at Green River, WY) got up to 72 degrees during spill, which is not detrimental to fish. In the future, care should be taken to ensure reasonable river temperatures, particularly during low inflow years when temperature management may be more challenging. It was suggested that planned spill occur earlier in order to take advantage of cooler surface water temperatures, but Reclamation indicated that this would not be feasible given the timing of runoff inflows.

It was suggested that Reclamation attempt to avoid drastic changes of 1,000 cfs or more, due to both flow and temperature concerns. Reclamation operators agreed that this would be preferred, and expect improved operations in the event of future spills. During the spill operation it was determined that there is a significant lag between the timing of reduced power plant discharges, and the reservoir achieving enough head to generate increased spill, even under the high inflow conditions (~2,500 cfs) of late July. In addition, the power generation turbines did not handle the combination of high head and low flows well, and the “rough zones” observed under these conditions were documented. These observations will be used to improve future operations.

Q: Do any of the stakeholders monitor oxygen levels in the river?

A: No, though river flows are believed to be close to saturation given the oxygenation that occurs as discharges pass through the turbines. The fact that fish are found throughout the lake strata indicates good oxygen content.

Q: Under what circumstances would the planned baseflow release of 1,300 cfs change?

A: The baseflow value could change if fall shapes up to be wetter or drier or if the spring runoff forecast changes significantly. The current 24-month study calls for slightly lower base flows, but operators are targeting 1,300 cfs due to the continued abundance of August precipitation. There is some potential for releases to stay at 1,650 cfs through mid-September in order to ensure pool elevation meets the spring flood control target. Currently, the spring runoff forecast skill is relatively low. The system has not yet returned to baseflow conditions. Skill will improve in the fall when the CBRFC sets its model parameters, including soil moisture, to initial conditions for WY 2015. Any release adjustments will be made as early as possible, and certainly before ice formation. It was noted that a decrease in releases after ice-up is detrimental to fish, while an increase in releases after ice-up can produce flooding. As a result, operational plans avoid release adjustments after ice-up occurs.

Q: How did the simultaneous peaking of the Yampa, Green, and Colorado Rivers impact operations at Flaming Gorge?

A: The timing of the peaks did not impact operations at Flaming Gorge due to implementation of the Larval Trigger Study Plan (LTSP). The LTSP requires peak releases be timed with the observed presence of razorback sucker larva, rather than with peak streamflows on the Yampa, as is required by the record of decision (ROD). Razorback sucker larva presence was detected on May 28th. Releases at Flaming Gorge were increased to bypass capacity when the Yampa River was on the descending limb, such that flows at Jensen exceeded 18,600 cfs for only four days. If Flaming Gorge had been operated according to the ROD rather than the LTSP plan, releases would have increased to bypass capacity earlier, catching the Yampa peak on the way up, and 14 days of flows above 18,600 cfs would have been targeted, resulting in a larger total releases volume. Because the ROD is set up for adaptive management, only the LTSP targets need to be met to show sufficient progress.

NEXT MEETING

The next meeting date was set for 10:00am on Wednesday, April 22nd, 2015 at the Seedskaadee Wildlife Refuge in Green River, Wyoming.

