Weekly Temperature Report
McNary Dam

August 16, 2021

Prepared by: Paul Wagner, Wes Stonecypher, and Eric Harries, Environmental Assessment Services, LLC

Report Period: August 6 through August 12, 2021

Report No. 2021 MCN Temperature Weekly Report 0806–0812 for EAS

Re: USACE Walla Walla District Biological Services: Temperature Monitoring Program at McNary Dam

Temperature monitoring at the McNary juvenile collection system began at 1200 hours on June 14 and is scheduled to continue through 0700 hours August 31. Wind speed data used in this report is from the National Weather Service station at the Hermiston Municipal Airport in Oregon. The air temperature data was obtained via an Onset temperature logger located on site at the McNary Juvenile Fish Facility (JFF). Units continued to be operated in a “sawtooth pattern” (operate every other unit) to reduce thermal stress to juvenile salmonids passing through the collection system.

Fish Collection

An estimated 356 juvenile salmonids were collected and 356 bypassed at the McNary JFF (Table 1). There was no weekly fish mortality in the sample or facility.

River Conditions

Average river flow for this reporting period was 134.8 kilo cubic feet per second (kcfs) with an average spill of 75.9 kcfs (Table 1).

Temperature Logger Operations

Temperature loggers were deployed on June 14. The temperature logger in gatewell Unit 12 did not operate from August 9 at 0900 hours to August 10 at 1000 hours. This temperature logger was replaced at 1030 hours August 10.

Weather Conditions

The weekly average air temperature from August 6 to August 12 was 76.6°F. Air temperatures ranged from a maximum of 99.5°F on August 11 to a minimum of 61.5°F on August 9 (Figure 1). Wind speeds averaged 9.6 mph with average gusts of 25.3 mph (Table 1). Wind direction was predominantly West Southwest.

Water Temperatures

Average water temperatures within dam locations varied with air temperatures and wind velocities (Figure 2). The weekly average temperatures within dam locations were: 72.7°F, forebay (weekly average of eight positions); 72.0°F, gatewell (weekly average of 14 positions); 72.1°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 71.9°F, JFF (weekly average of the separator and sample tank “B”). Forebay Units 8 and

10 had the highest weekly average temperature, 72.9°F (Figure 3). The maximum temperature, 83.3°F, was recorded in Forebay Unit 14 at 1530 hours on August 11.

The average weekly temperature differentials within dam locations were: 1.4°F, forebay; 1.9°F, gatewells; 0.4°F, collection channel; and 0.1°F, JFF (Figure 4). The largest temperature differential, 11.2°F, was recorded in the forebay at 1530 hours on July 29 (Unit 14 high, Unit 5 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 0.7°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 9.9°F at 1700 hours on August 11 at Unit 8 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 0.6°F. On average, the collection channel was warmer than the gatewells at Units 1 and 8. The largest temperature differential between the gatewell and corresponding collection channel location was 4.1°F at 1930 hours on August 11 at Unit 8 (collection channel was warmer than the gatewell).

Table 1
Bypass, Mortality, and River and Weather Conditions from August 6 to August 12

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow (kcfs)	Avg. Turbine Flow (kcfs)	Avg. Spill (kcfs)	Air Temperature (°F)		Wind Speed (mph)	
			Sample	Facility				Avg.	Max	Avg.	Max
6-Aug					142.4	56.4	81.3	78.0	91.3	13.2	23.0
7-Aug	128	128	0	0	129.2	51.0	73.5	77.0	86.3	15.2	25.3
8-Aug					112.0	50.8	56.6	78.5	89.1	17.1	21.9
9-Aug	216	216	0	0	130.3	51.2	74.5	70.3	80.6	10.0	21.9
10-Aug					133.8	52.6	76.4	71.9	84.2	3.5	8.1
11-Aug	12	12	0	0	140.3	55.5	80.1	77.5	90.0	3.8	8.1
12-Aug					155.4	62.1	88.7	83.2	99.5	4.2	6.9
Weekly Total	**356**	**356**	**0**	**0**	**134.8**	**54.2**	**75.9**	**76.6**	**88.7**	**9.6**	**16.4**

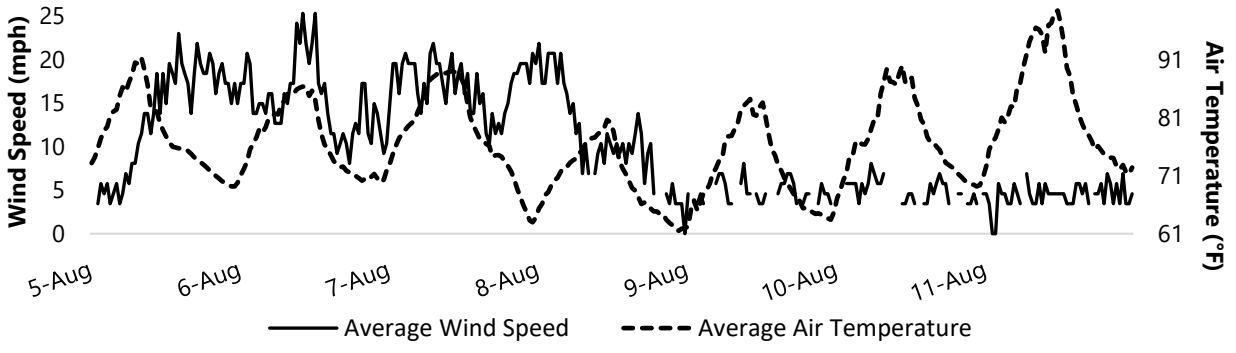

Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from August 6 to August 12

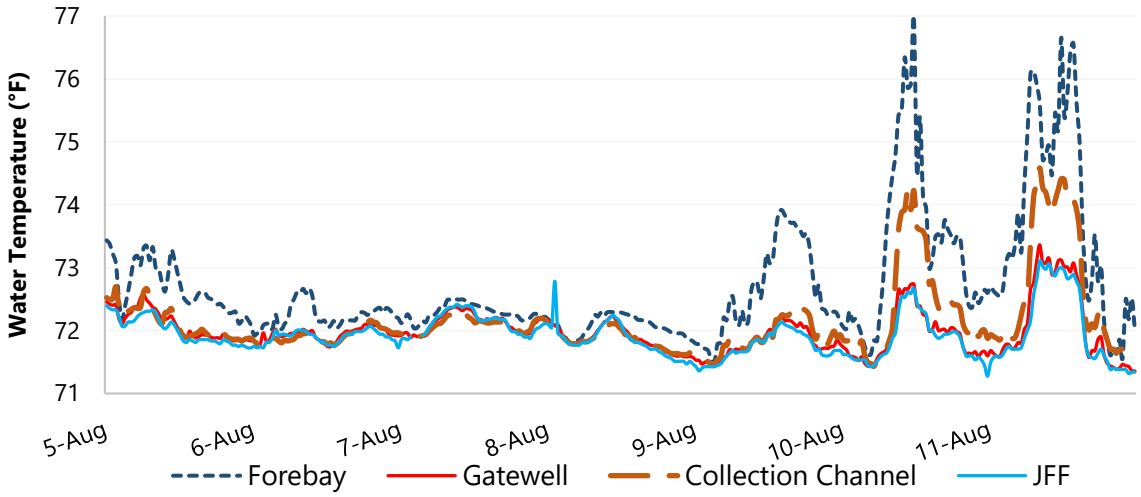

Figure 2
Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from August 6 to August 12

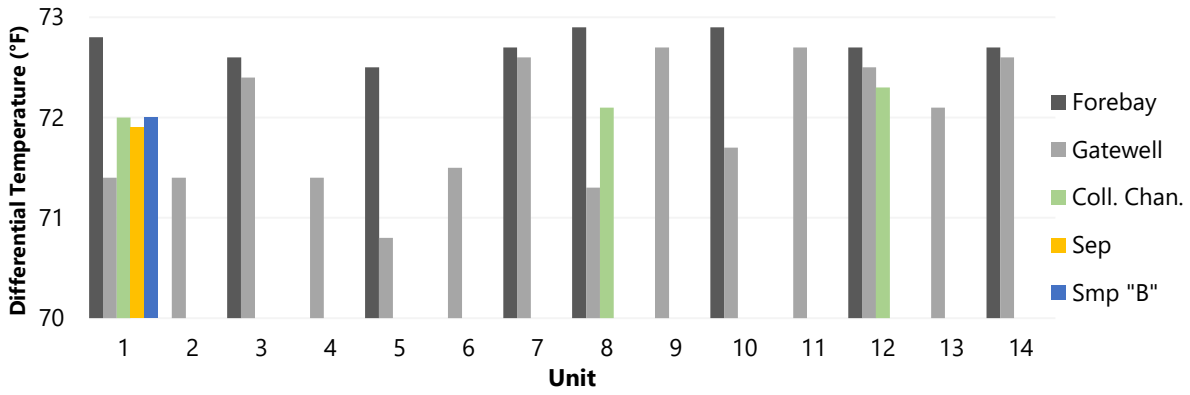

Figure 3
Average Weekly Water Temperatures by Position for Five Dam Locations from August 6 to August 12

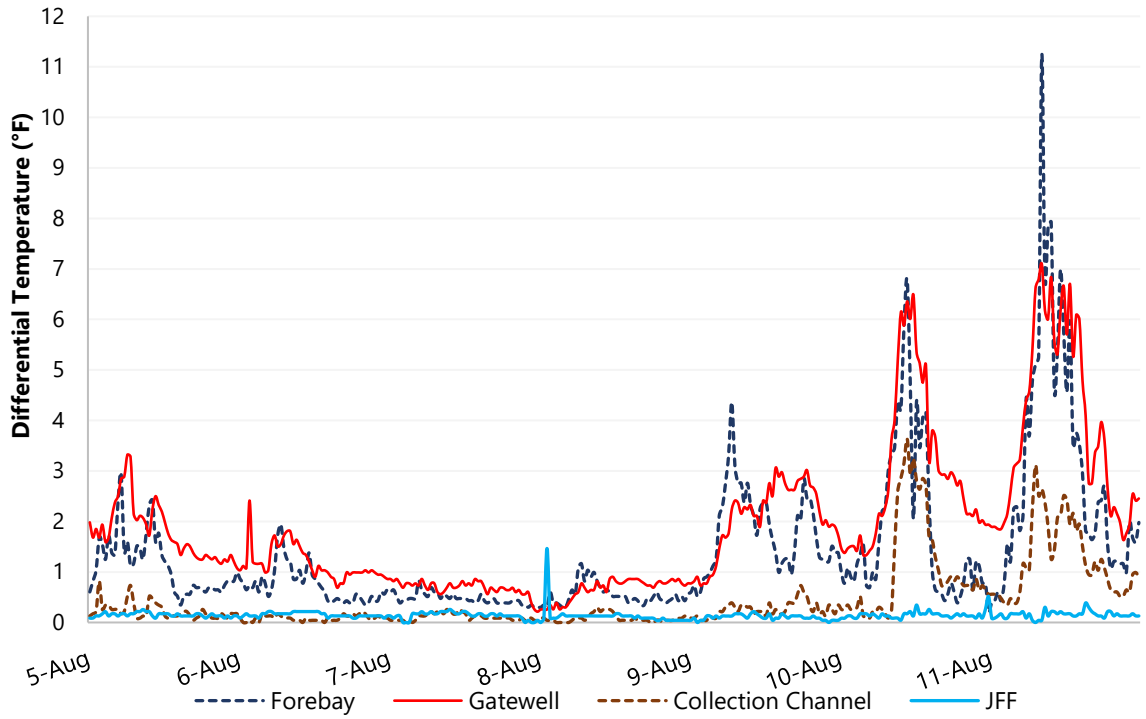

Figure 4
Average Differential Temperatures within Four Dam Locations from August 6 to August 12

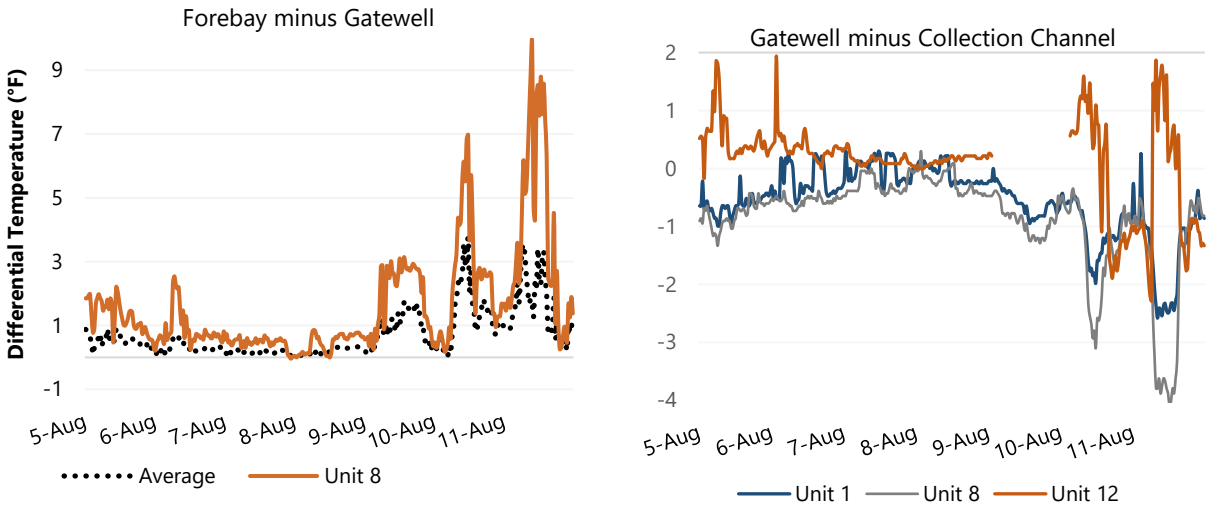

Figure 5
Average Differential Temperatures across Three Dam Locations from August 6 to August 12