Weekly Temperature Report
McNary Dam

June 27, 2022

Prepared by:	Jeff Christopherson, and Eric Harries, Environmental Assessment Services
Report Period:	June 17 through June 23
Report No.	2022 MCN Temperature Report 0617–0623 by EAS
Re:	**USACE Walla Walla District Biological Services: Temperature Monitoring Program at McNary Dam**

Temperature monitoring at the McNary juvenile collection system began at 0700 hours on June 14 and will continue through 0700 hours August 31. Wind speed data used in this report are from the National Weather Service station at the Hermiston Municipal Airport in Oregon. The air temperature data was obtained via Hobo probe at the JFF. Operation of Units in a “sawtooth pattern” (operate every other unit) to reduce thermal stress to juvenile salmonids passing through the collection system ended on August 31. The temperature monitoring program began with only two days left in the June 10 to June 16 report period, for this reason there was no weekly temperature report for that report period. Data from June 15 and 16 has been included in this report.

Fish Collection

An estimated 291,204 juvenile salmonids were collected and 291,193 were bypassed at the McNary JFF (Table 1). There were 5 fish mortalities in the sample on for the reporting period.

River Conditions

Average river flow for this reporting period was 420.5 kilo cubic feet per second (kcfs) with an average spill of 283.7 kcfs (Table 1).

Temperature Logger Operations

Temperature loggers were deployed on June 14. All temperature loggers performed normally.

Weather Conditions

The weekly average air temperature from June 15 to 23 was 66.1°F. Air temperatures ranged from a maximum of 101.0°F on June 22 to a minimum of 51.0°F on June 15 (Figure 1). Wind speeds averaged 9.5 mph with gusts of 20.7 mph (Table 1). Wind direction was predominantly West by 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: 56.3°F, forebay (weekly average of eight positions); 56.0°F, gatewell (weekly average of 14 positions); 56.0°F, collection channel (weekly average of positions at Units 1, 8, and 12); and 56.1°F, JFF (weekly average of the separator and sample tank “B”). Forebay Unit 1 had

the highest weekly average temperature, 56.6°F (Figure 3). The maximum temperature, 64.7°F, was recorded in forebay Unit 3 at 1630 hours on June 20.

The average weekly temperature differentials within dam locations were: 1.2°F, forebay; 0.8°F, gatewells; 0.2°F, collection channel; and 0.1°F, JFF (Figure 4). The largest temperature differential, 7.2°F, was recorded in the gatewell at 1800 hours on June 21 (Unit 1 high, Unit 2 low).

The average weekly temperature differential between the forebay and corresponding gatewell was 0.4°F. The forebay was warmer than the corresponding gatewell on average across the powerhouse. The largest temperature differential was 5.4°F at 1630 hours on June 22 at Unit 1 (forebay warmer than gatewell; Figure 5). The average weekly temperature differential between the gatewell and corresponding collection channel location was 0.5°F. On average, the gatewells were warmer than the collection channels at Units 1, 8, and 12. The largest temperature differential between the gatewell and corresponding collection channel location was 2.2°F at 1600 hours on June 21 at Unit 1 (gatewell was warmer than the collection channel).

Table 1
Bypass, Mortality, and River and Weather Conditions from June 17 to June 23

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow	Avg. Turbine Flow	Avg. Spill	Air Temperature		Wind Speed	
			Sample	Facility				Avg.	Max	Avg.	Max
15-Jun					431.2	132	294.5	61.9	77.7	12.2	20.7
16-Jun	39,800	39,798	2		441.2	116.6	319.8	68.3	84.6	6.7	17.3
17-Jun					435.7	115.4	315.6	66.1	76.4	8.1	16.1
18-Jun	123,901	123,898	2	1	436.8	137.4	294.7	62.9	78.8	12.4	19.6
19-Jun					408.4	136.8	266.8	59.4	67.9	11.4	18.4
20-Jun	57,400	57,399		1	418.7	138.1	275.9	64.5	85.6	12.9	19.6
21-Jun					414	141.4	267.9	66.9	95.9	8.8	17.3
22-Jun	70,103	70,098	1		400.1	133.4	262	71.6	101.0	4.9	9.2
23-Jun					398.8	138.1	255.9	73.0	97.3	8.2	17.3
Weekly Total	**291,204**	**291,193**	**5**	**2**	**420.5**	**132.1**	**283.7**	**66.1**	**85.0**	**9.5**	**17.3**

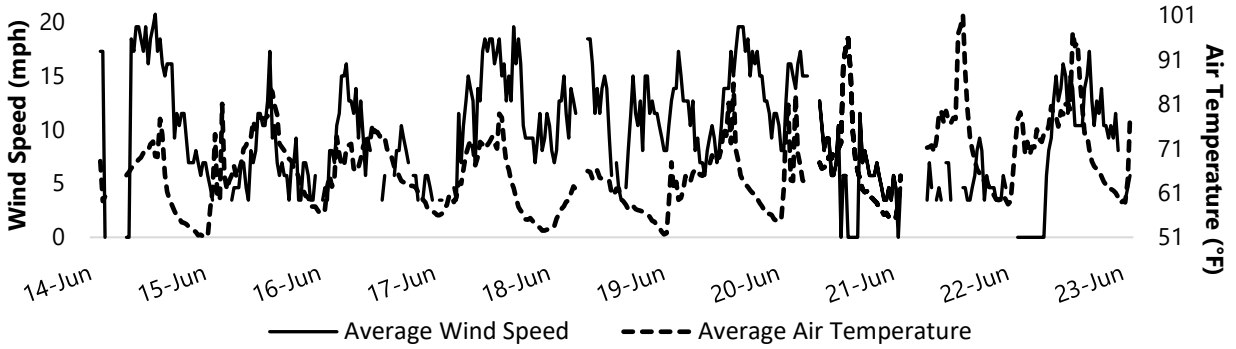

Figure 1
Average Wind Speed and Air Temperature for Each Half-Hour Interval from June 17 to June 23

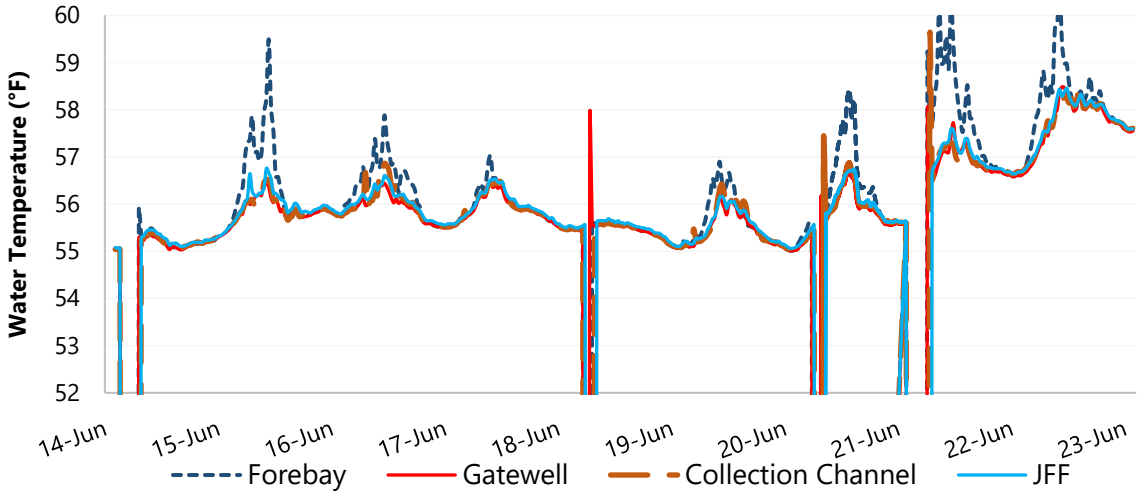

Figure 2
Average Water Temperatures for Each Half-Hour Interval for Four Dam Locations from June 17 to June 23

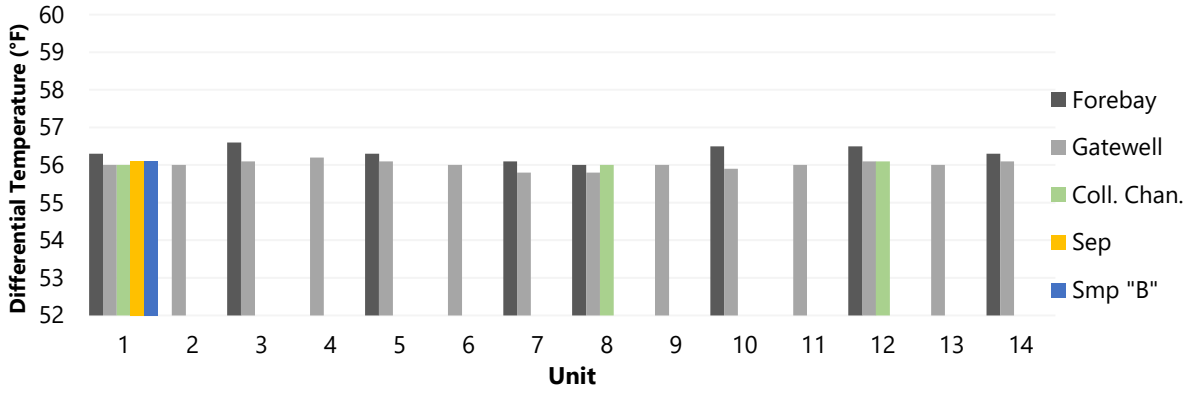

Figure 3
Average Weekly Water Temperatures by Position for Five Dam Locations from June 17 to June 23

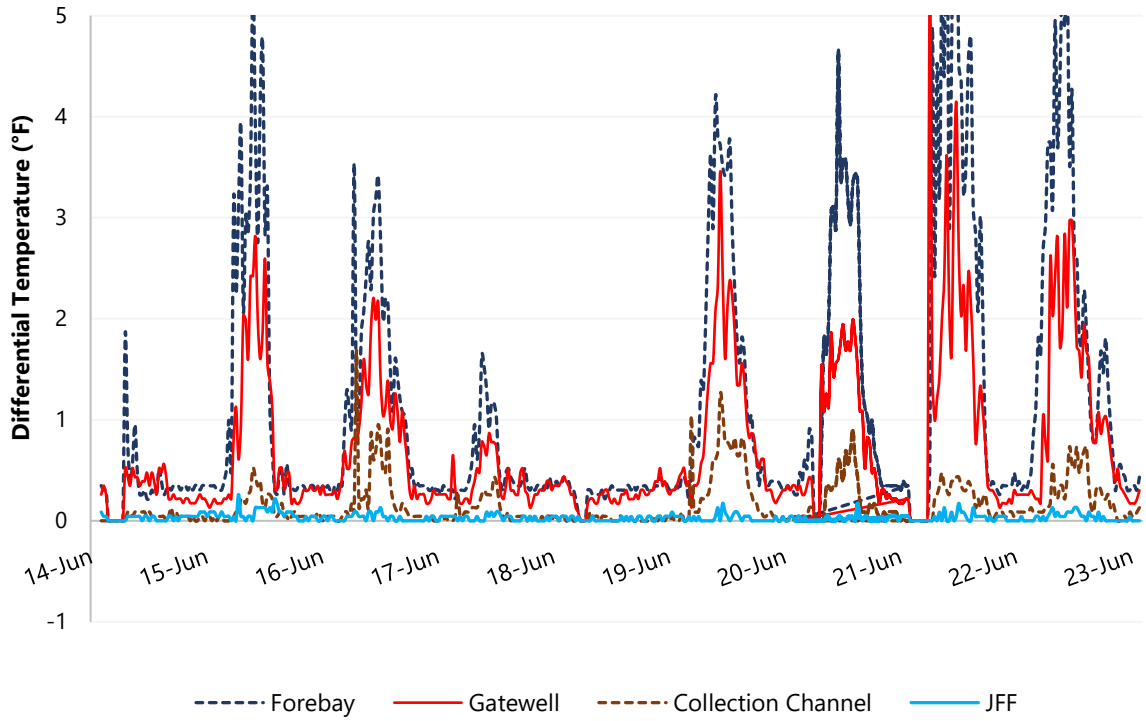

Figure 4
Average Differential Temperatures within Four Dam Locations from June 17 to June 23

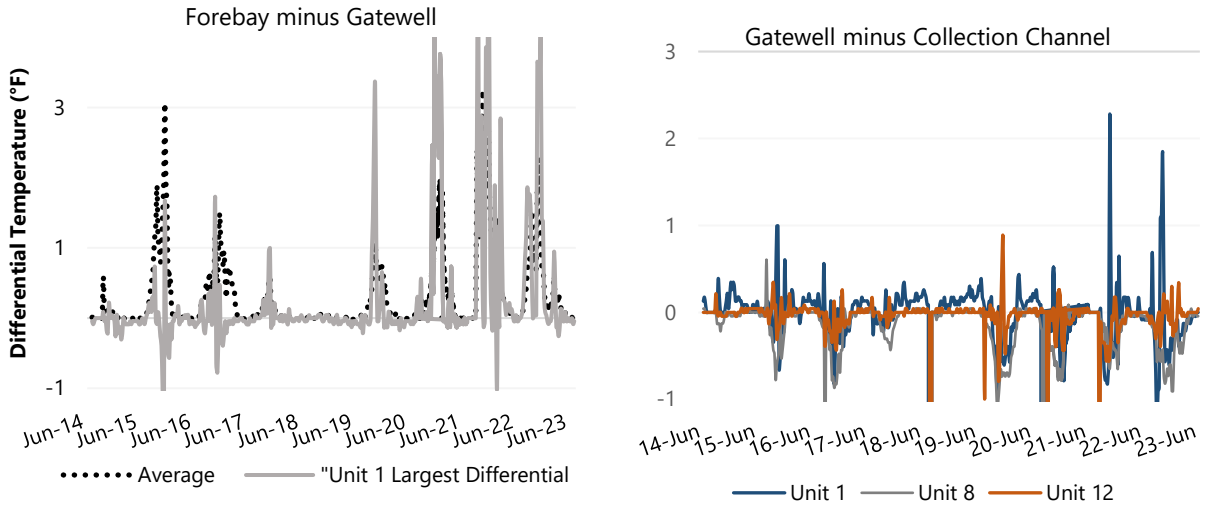

Figure 5
Average Differential Temperatures across Three Dam Locations from June 17 to June 23