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

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		Report Period:	July 1 to 7, 2016
Report No.	MCN TEMP 6-16		

Fish Collection

An estimated 296,602 juvenile salmonids were collected, and 296,596 juvenile salmonids bypassed the McNary Juvenile Fish Facility (JFF; Table 1), comprising 100% subyearling Chinook salmon. There were total of 6 juvenile system mortalities, comprising 2 sample mortalities and 4 facility mortalities.

River Conditions

Average river flow for this reporting period was 178,300 cubic feet per second (178.3 kcfs), with an average spill of 89.2 kcfs.

Weather Conditions

The weekly average daytime temperature for June 30 to July 7 was 76.0 °F. The weekly average nighttime temperature was 69.9 °F. Temperatures ranged from a maximum of 91.0 °F at 1800 on June 30 to a minimum of 57.3 °F from 0600 to 0630 on July 6.

Winds averaged 1.2 miles per hour (mph) this week and were predominately from the north (Figure 1). The wind was highest at 2130 on July 5, with winds averaging 10 mph and gusts measuring up to 25 mph.

Probe Operations

On July 6, it was discovered that recorded water temperatures were not consistent with expected temperature values given the current operations at the project. Examination of calibration notes from earlier in the season revealed the calibration temperature offset had

been entered in degrees Fahrenheit. The probe program called for the offset to be in degrees Celsius.

To recalibrate, all probes were collected and prepped for calibration according to the manufacturer's instructions (one-point calibration; MadgeTech) and placed in a water/ice bath to acclimate for 5 minutes. The water/ice bath was chosen as a stable temperature environment because the temperature would remain at 0 °C until the ice has melted. After acclimation, the bath was stirred continuously for 10 minutes and the temperature monitored at several locations with two digital thermometers to ensure temperature homogeneity. The data was downloaded and examined for a time point at which the temperature had stabilized. The temperature at that time point was then used as the measured temperature for each probe. The difference between the measured temperature and the actual temperature was calculated and used as the offset for that probe.

All forebay, gatewell, collection channel, and JFF probes were redeployed between 1600 and 1800 on July 7. Tailwater and spillbay probes were redeployed between 0630 and 0800 on July 8. The wing wall probe was not redeployed.

Corrections to previously collected temperature data will not be performed, because the difference between the current and corrected temperature values would be ±1 °F in most cases. Corrections can be performed if necessary. Analysis of this week's temperature data is not included in this report.

At the time of redeployment, the probe at the Gatewell 8 was replaced with the wing wall probe. The Gatewell 8 probe may be reporting incorrect temperatures, but this is likely not due to the calibration issue. Laboratory tests will be conducted to determine if this probe is malfunctioning. If it is deemed usable, it will be deployed at the wing wall.

Table 1
Bypass, Mortality, and River and Weather Conditions from 0700 June 30 to 0700 July 7

Date	Fish Collected	Fish Bypassed	Mortality		Avg. River Flow	Avg. Turbine Flow	Avg. Spill	Air Temperature		Wind Speed	
			Sample	Facility				Avg.	Max	Avg.	Max
Jun 30 – Jul 1					184.8	87.6	92.5	75.5	91.0	0.8	3.0
Jul 1 – 2	222,100	222,098	2	0	200.0	95.2	100.0	76.9	90.3	1.3	4.0
Jul 2 – 3					172.1	81.2	86.2	76.4	90.3	1.0	3.0
Jul 3 – 4	60,102	60,100	0	2	169.8	80.0	85.1	72.3	84.1	1.9	7.0
Jul 4 – 5					174.9	82.6	87.6	69.1	81.6	1.5	9.0
Jul 5 – 6	14,400	14,398	0	2	165.5	78.1	82.7	68.8	79.9	1.4	10.0
Jul 6 – 7					180.8	85.7	90.4	70.3	83.8	0.6	5.0
Weekly Totals.	**296,602**	**296,596**	**2**	**4**	**178.3**	**84.3**	**89.2**	**62.4**		**1.2**	

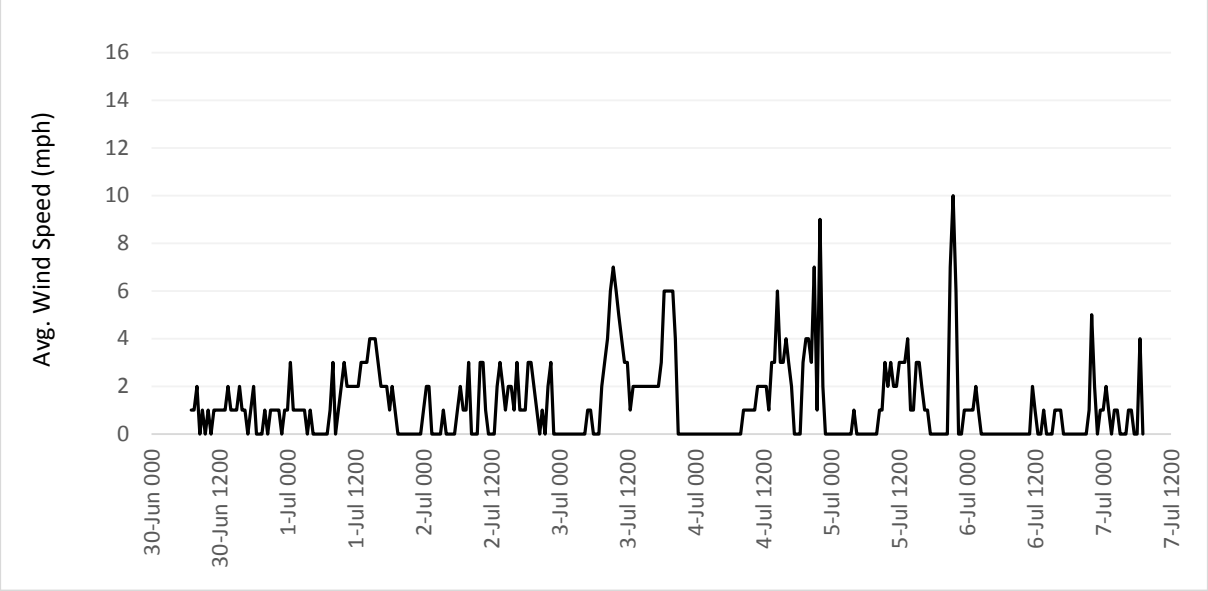

Figure 1
Average Wind Speed from 0700 June 30 to 0700 July 7

References

MadgeTech (MadgeTech, Inc.). *MadgeTech 4 Standard Software Manual.* Revision 1.0.8. Warner, New Hampshire.