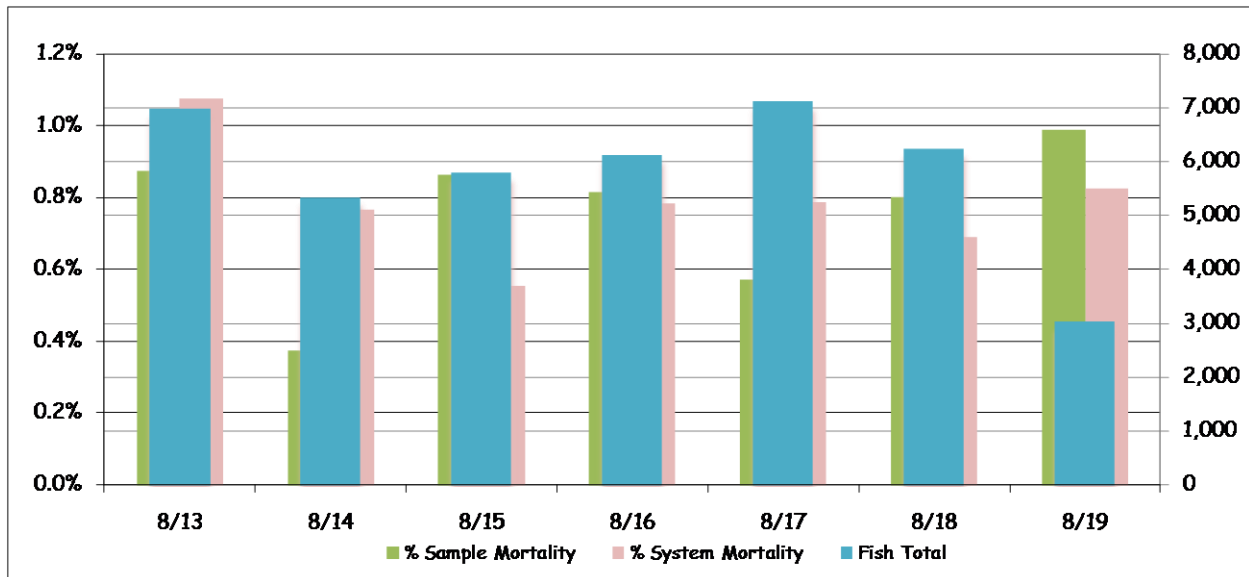




PSMFC McNary Dam, P.O. Box 1230, Umatilla, Oregon 97882  
 Phone (541) 922-3630 Fax (541) 922-4101

**McNary Temperature Report #10**  
**August 13 - 19, 2010**

A total of 40,600 juvenile salmonids were collected at the McNary Juvenile Fish Facility (JFF) for this weekly period. Peak collection day was August 17 with 7,110 fish (Figure 1 and Table 1). Subyearling fall chinook accounted for 99.9% of the total collection. Daily flows for this week averaged 131.5kcfs. There has been court ordered spill since April 10. Spill averaged 65.7kcfs. The system mortality averaged 0.8% and sample tank mortality averaged 0.7%. Mortalities are being enumerated from all raceways, the sample tanks and the recovery raceway.



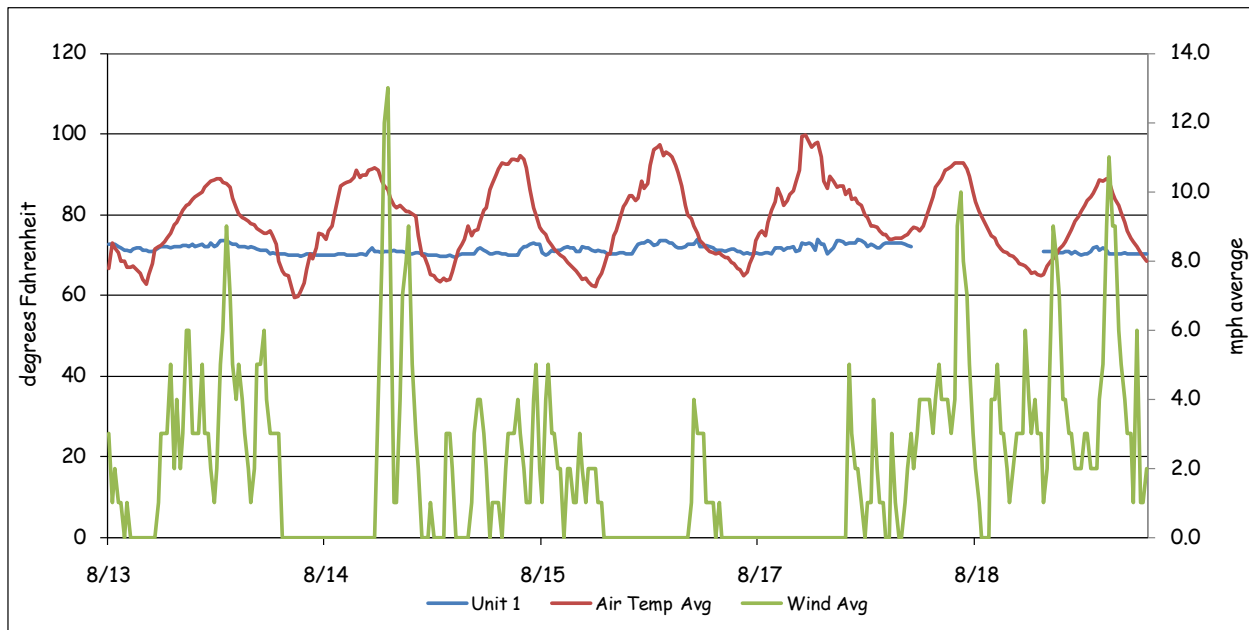
**Figure 1: Collection and Mortality**

**Table 1:** Collection and Mortality With Daily and Weekly Averages

	Collection	Mortality		Flow			Air Temp		Wind Speed	
		Sample	System	Total	Turbine	Spill	Avg.	Max.	Avg.	Max.
8/13/10	6,970	0.87%	1.08%	132.6	61.9	66.0	77.1	89.3	2.6	18.0
8/14/10	5,340	0.37%	0.77%	132.0	61.5	65.8	78.2	92.1	1.9	21.0
8/15/10	5,790	0.86%	0.55%	121.6	56.4	60.5	78.4	94.7	2.1	17.0
8/16/10	6,130	0.82%	0.78%	111.3	51.1	55.6	78.3	97.5	0.8	7.0
8/17/10	7,110	0.57%	0.79%	127.0	58.6	63.8	80.6	100.4	0.3	20.0
8/18/10	6,230	0.80%	0.69%	147.3	68.9	73.7	81.1	93.6	2.9	24.0
8/19/10	3,030	0.99%	0.83%	148.6	69.3	74.6	74.7	89.3	3.9	27.0
<b>Weekly Average</b>	5,800	0.74%	0.79%	131.5	61.1	65.7	78.3	100.4	2.1	27.0

Fish are being transported by barge with a 24-hour sample taken every day until the end of the barging contract, August 17. This past week there was transportation by truck in between the barge days. This was to alleviate the stress of holding fish in raceways with water greater than 68.0 °F. There will be units that are off line for the remainder of the season. Units 2 and 7 are off for rewinding. Units 3 and 4 are off for transformer replacement. This means that the probes in 3 and 4 will be put in the “A” slot and “C” slot respectively. All other orifices are open.

Air temperatures did warm up this past week with an average of 78.3°F. Maximum hourly air temperature was 100.4 F on August 17 (Figure 2). The minimum temperature was 59.3°F on August 14 at 6:00a.m. Winds over the course of the week averaged 2.1mph with gust peaking up to 27.0mph on August 19.



**Figure 2:** Weather and Forebay Water Temperature

There are 36 temperature probes located through out the Project and the JFF. These probes are set to record temperatures at 30-minute intervals. These probes are located at the following locations:

- 1) Forebay, near elevation 335 approximately 5 feet below the surface. These are attached to the pier noses in front of turbine units 1, 3, 5, 7, 8, 10, 12, and 14.
- 2) In front of spillbays 21, 17, 12, 7 and 2, approximately 5 feet below the surface. These probes are hung in the center of the spillbay, on the tailrace side.
- 3) Attached to the handrail in the center of the “B” turbine gatewell slots, approximately 2 to 3 feet below the surface, in all 14 turbine units.
- 4) Tailwater locations are at turbine unit 1 and 14 (tailrace), and the wingwall of the navigation lock. These were placed 5 feet below the water surface.
- 5) The collection channel had probes installed below turbine units 12, 8 and past unit 1 at the beginning of the transition screen.
- 6) The barge transportation dock.
- 7) Fish separator.
- 8) Transport holding raceway #1 at a depth of 2 – 3 feet.

Forebay water temperatures (Table 2) peaked this week with 79.2°F on August 16 at 3:30p.m., in front of unit 14. The average was 71.9°F across the forebay. Gatewell water temperatures for all units combined averaged 70.7°F (Table 3). Gatewell temperatures peaked at 75.9°F on August 17 in unit 8 at 5:30p.m.

**Table 2: Forebay Water Temperatures**

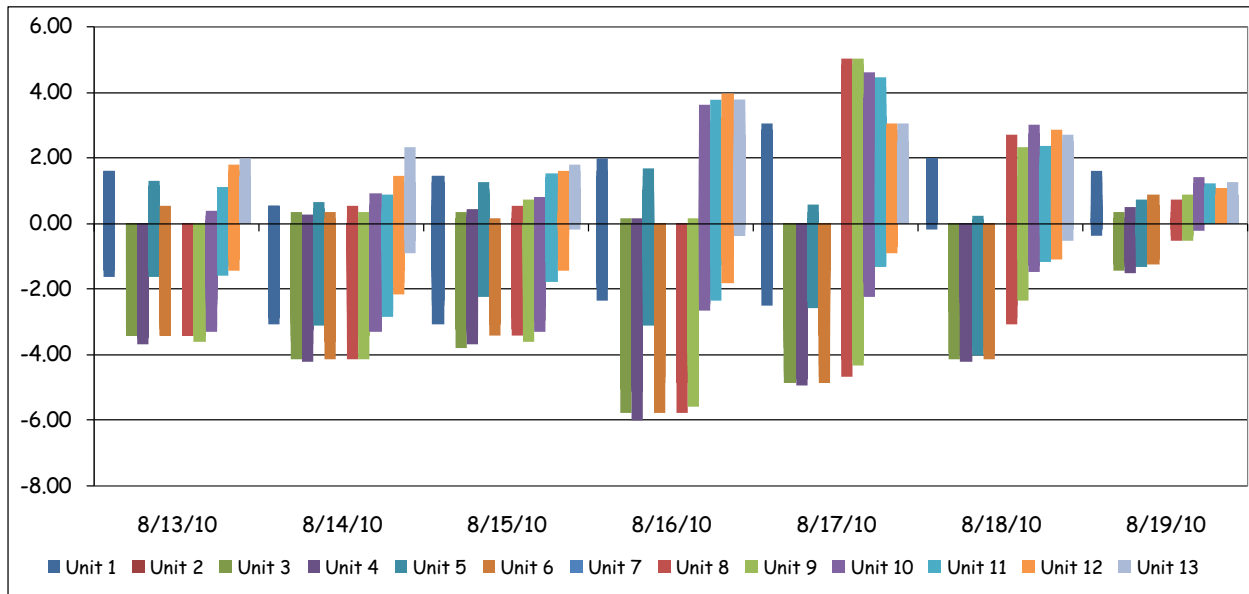
	Daily Average								Daily Max
	1F	3F	5F	7F	8F	10F	12F	14F	
8/13/10	72.9	72.3	72.5	72.4	72.2	72.0	72.2	71.7	74.6
8/14/10	71.4	70.1	70.9	70.5	70.5	70.4	71.4	71.4	76.1
8/15/10	71.2	70.9	71.4	71.2	71.2	71.1	71.4	71.1	74.6
8/16/10	73.0	72.1	73.0	72.4	72.5	73.6	74.1	73.4	79.2
8/17/10	73.8	72.6	73.2	72.8	73.1	73.2	73.6	72.2	79.0
8/18/10	72.7	72.2	72.3	72.3	72.2	72.1	72.2	71.0	75.0
8/19/10	71.2	70.8	71.1	71.2	71.0	70.8	70.8	70.2	72.2
<b>Weekly Average</b>	72.3	71.6	72.1	71.8	71.8	71.9	72.2	71.6	79.2

**Table 3: Gatewell Water Temperatures for Units 1, 7 & 14**

	Daily Avg.			Daily Max.			Daily Min.		
	1	7	14	1	7	14	1	7	14
8/13/10	72.1		71.8	73.6		73.0	70.7		70.3
8/14/10	70.4		70.9	71.6		73.6	69.6		69.8
8/15/10	70.6		70.8	73.0		73.0	69.4		69.8
8/16/10	71.8		71.8	73.8		75.4	70.2		69.8
8/17/10	71.6	69.7	71.7	73.8	70.2	74.3	70.2	69.4	70.7
8/18/10	72.7	69.6	71.2	73.8	70.0	73.6	71.6	69.4	70.2
8/19/10	70.6	70.4	70.4	72.0	71.2	70.9	70.0	69.6	70.2
<b>Average</b>	71.3	69.9	71.2	73.1	70.5	73.4	70.2	69.5	70.1

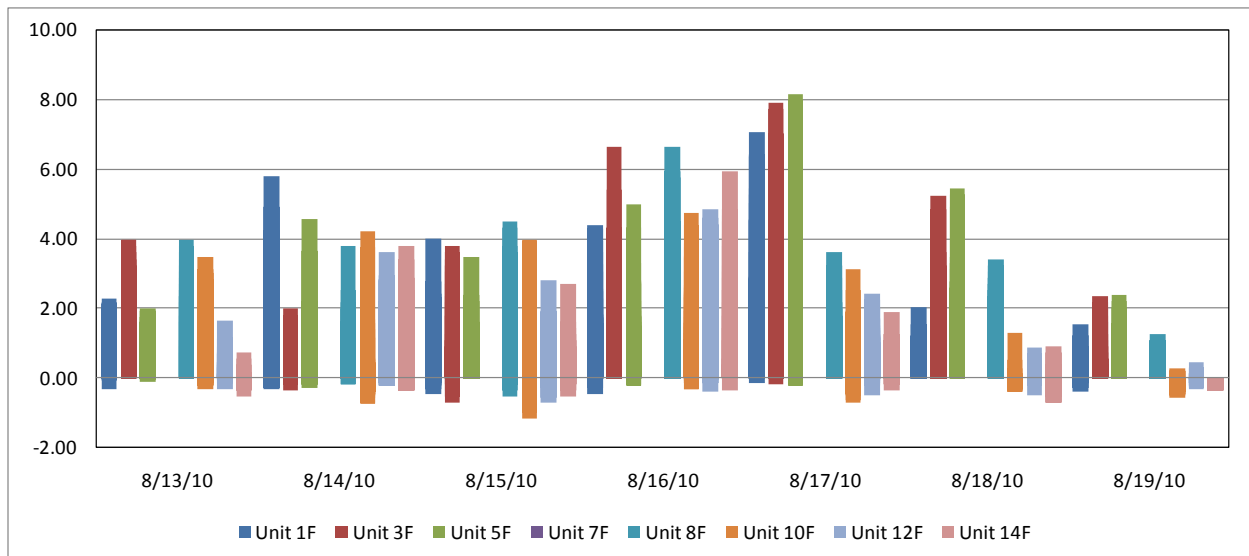
The differences in temperatures between the gatewell at unit 1 and the gatewell at unit 14 are illustrated in Figure 3. This graph takes the temperature in the gatewell and subtracts unit 14 from that gatewell (unit 1 – 14). It then continues down the powerhouse subtracting unit 14 from each consecutive unit. A negative number indicates that unit 14 was the warmer unit. Conversely, a positive number indicates that

unit 1 was warmer. This shows the reader the amount of variance from one end of the powerhouse to the other that can be seen through out a 24-hour period.



**Figure 3:** Gatewell Temperature Differentials for Units 1- 14

Forebay differentials (Figure 4) are calculated by taking the forebay temperature and subtracting the corresponding gatewell temperature from it (1F – unit 1). A negative number would indicate that the gatewell was warmer. Conversely, a positive number indicates that the forebay is warmer. Again, this shows the reader the amount of variance that can be seen between the forebay and the gatewell through out a 24-hour period.



**Figure 4:** Temperature Differentials Between Forebay and Gatewell

Average water temperature in the collection channel was 71.0°F (Table 4) for the week. A maximum temperature of 74.1°F was recorded August 16 at 10:00p.m. below Unit 12 and again at midnight on the 17th. Temperatures at the separator averaged

70.5°F for the week with a maximum daily temperature of 71.8°F (Table 5). The temperature in raceway #1 averaged 70.6°F with a high of 71.8°F August 17 from 4:30 until 7:30 in the evening.

**Table 4:** Collection Channel Average and Maximum Water Temperatures

	Daily Avg.			Daily Max.		
	1	8	12	1	8	12
8/13/10	71.0	70.8	71.8	71.6	71.6	72.9
8/14/10	70.3	70.2	70.8	71.4	71.1	73.0
8/15/10	70.4	70.2	70.8	71.2	71.1	72.9
8/16/10	71.2	71.3	72.2	72.1	72.7	74.1
8/17/10	71.5	72.0	72.1	72.3	73.8	74.1
8/18/10	71.1	71.3	71.5	71.6	72.0	72.9
8/19/10	70.7	70.4	70.5	71.1	71.4	71.1
<b>Average</b>	70.9	70.9	71.4	71.6	71.9	73.0

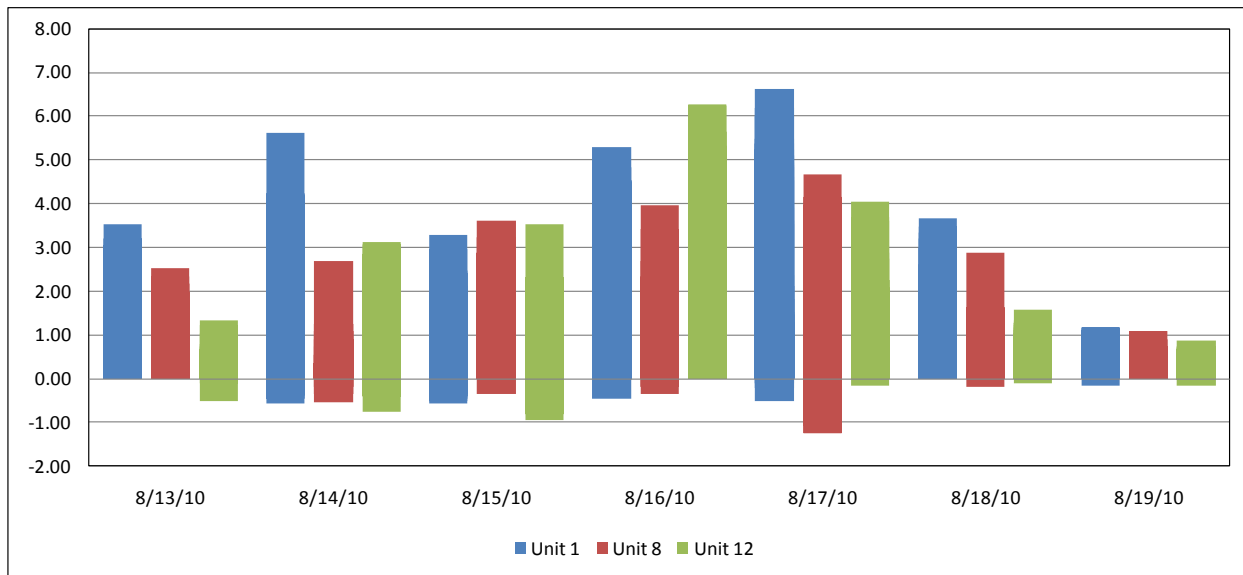
**Table 5:** Raceway, Barge Dock and Separator Maximum and Average Water Temperatures

	Daily Avg.			Daily Max.		
	Separator	Raceway 1	Dock	Separator	Raceway 1	Dock
8/13/10	70.7	70.7	70.3	71.4	71.4	70.7
8/14/10	70.2	70.2	69.9	71.2	71.2	71.0
8/15/10	70.1	70.1	70.0	70.9	70.9	70.7
8/16/10	70.7	70.8	70.2	71.4	71.4	70.7
8/17/10	70.9	71.0	70.2	71.8	71.8	70.4
8/18/10	70.6	70.7	70.3	71.1	71.2	70.7
8/19/10	70.4	70.4	70.5	70.9	70.9	70.7
<b>Average</b>	70.5	70.6	70.2	71.2	71.3	70.7

Collection channel differentials (Table 6) are calculated by taking the forebay temperature and subtracting the collection channel temperature from it at the three corresponding points. This is an average of the variances between the forebay and the collection channel. A negative number indicates that the collection channel was warmer. A positive number indicates the forebay was warmer. The graph (Figure 5) shows the variance through out the week.

**Table 6:** Average Differences between Forebay and Collection Channel

	1	8	12
8/13/10	2.0	1.4	0.4
8/14/10	1.0	0.4	0.6
8/15/10	0.8	1.0	0.6
8/16/10	1.9	1.2	1.9
8/17/10	2.4	1.1	1.5
8/18/10	1.6	0.9	0.6
8/19/10	0.5	0.6	0.3
<b>Average</b>	1.5	0.9	0.9
<b>Maximum</b>	6.6	4.7	6.3
<b>Minimum</b>	-0.6	-1.3	-0.9



**Figure 5:** Temperature Differentials Between Forebay and Collection Channel