



# Fish Passage Center

## Weekly Report #09 - 24

August 21, 2009

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### Summary of Events:

**Water Supply:** Precipitation throughout the Columbia Basin has varied between 56% and 317% of average at individual sub-basins through August. Precipitation above The Dalles has been 189% of average over August. Over the entire water year, precipitation has generally been near average.

**Table 1. Summary of August Precipitation and cumulative October through August precipitation with respect to average (1971-2000), at select locations within the Columbia and Snake River Basins.**

Location	Water Year 2009 August 1-17		Water Year 2009 October 1, 2008 to August 1-17, 2009	
	Observed (inches)	% Average	Observed (inches)	% Average
Columbia Above Coulee	1.65	178	21.67	93
Sneke River Above Ice Harbor	0.93	197	19.00	115
Columbia Above The Dalles	1.23	189	21.90	101
Kootenai	1.48	160	21.28	89
Clark Fork	1.65	232	17.43	108
Flathead	1.88	213	20.29	95
Pend Oreille/ Spokane	1.61	231	28.34	97
Central Washington	0.12	57	7.05	83
Sneke River Plain	0.51	161	12.54	119
Salmon/Boise/ Payette	1.22	317	18.71	99
Clearwater	1.98	300	31.57	109
SW Washington Cascades/Cowlitz	1.34	159	60.32	89
Willamette Valley	0.33	56	48.55	85

Table 2 displays the June Final and July Final runoff volume forecasts for multiple reservoirs. The most notable differences between the June Final and July Final forecasts came at Libby Dam and Lower Granite Dam. At Libby, the July Final forecast decreased 11% relative to the June Final Forecast. At Lower Granite Dam, the July Final forecast increased 7% relative to the June Final Forecast, it appears most of the increase at Lower Granite was due to an increase in water supply above Brownlee Dam (increased 14%). The Water Supply Forecast at The Dalles between January and July is 89300 Kaf (83% of average).

**Table 2. June Final and July Final Runoff Volume Forecasts for various reservoirs within the Columbia and Snake River Basins.**

Location	June Final		July Final	
	% Average (1971- 2000)	Probable Runoff Volume (Kaf)	% Average (1971- 2000)	Probable Runoff Volume (Kaf)
The Dalles (Jan-July)	86	92000	83	89300
Grand Coulee (Jan-July)	85	53700	79	49600
Libby Res. Inflow, MT (Apr-Aug)	80	5000 5062*	69	4330
Hungry Horse Res. Inflow, MT (Jan-July)	93	2060	91	2020
Lower Granite Res. Inflow (Apr- July)	102	21900	109	23500
Brownlee Res. Inflow (Apr-July)	76	4780	90	5710
Dworshak Res. Inflow (Apr-July)	98	2590 2597*	97	2570

\*Denotes COE Forecast

The summer flow period began on 6-21-09 at Lower Granite Dam and the objective is 52.5 Kcfs. Flows at Lower Granite have average 51.4 Kcfs over the summer period and 32.1 Kcfs last week.

The summer flow period began on July 1 at McNary Dam and the objective is 200 Kcfs. Flows at McNary Dam have averaged 147.3 Kcfs over the summer period and 107.0 Kcfs last week.

Grand Coulee Reservoir is at 1281.5 feet (8-20-09) and drafted 2.0 feet over the last week. Outflows at Grand Coulee have ranged between 44.2 and 90.9 Kcfs over the last week. At the TMT Meeting on 8-19-09, the Salmon Managers voiced concern to the Action Agencies regarding Grand Coulee Dam refilling over several days last weekend and early this week when lower Columbia flows were extremely low (less than 100 Kcfs at McNary). The Salmon Mangers asked the Action Agencies to smoothly draft Grand Coulee to its summer elevation of 1278 feet by August 29, 2009 to ensure the Grand Coulee water would bolster lower Columbia flows through August 31<sup>st</sup>, 2009 (the end of the flow objective and spill period). At the TMT on August 21, 2009, the Action Agencies agreed to the draft of Grand Coulee by August 29, 2009 and will attempt to target a flow at McNary of at least 105 Kcfs.

The Libby Reservoir is currently at elevation 2443.2 feet (8-20-09) and has refilled 0.6 feet last week. Outflows at Libby are currently 7 Kcfs (minimum bull trout flow) and will remain at this level through August.

Hungry Horse is currently at an elevation of 3556.2 ft (8-20-09) and has drafted 1.1 feet last week. Outflows at Hungry Horse have been approximately 2.5 Kcfs last week. The BOR plans to draft Hungry Horse to elevation 3550 by the end of September.

Dworshak is currently at an elevation of 1546.2 feet (8-20-09) and has drafted 7.8 feet last week. Outflows at Dworshak were increased to 12 Kcfs on the afternoon of 8-18-09 due to temperature concerns at Lower Granite Dam. Outflows at Dworshak are expected to remain at 12 Kcfs through noon today then drop to full powerhouse flows (approximately 10 Kcfs) over the weekend and further drop to 8 Kcfs early Monday morning.

The Brownlee Reservoir was at an elevation of 2058.9 feet on August 20<sup>th</sup>, 2009, drafting 2.0 feet last week. Outflows at Brownlee Dam have been 8.1 to 16.5 Kcfs over the last week.

**Spill:**

The 2009 planned summer spill program at the lower Snake River Projects began at 0001 hours on June 20, 2009. The following table shows the planned operations for 2009.

<b>Project</b>	<b>Day/Night Spill</b>
Lower Granite	18Kcfs/18Kcfs
Little Goose	30%/30%
Lower Monumental	17Kcfs/17Kcfs
Ice Harbor	45Kcfs/Gas Cap

Lower Granite Dam spilled at, or above, the Court Order, except on the 16<sup>th</sup> and 17<sup>th</sup> when lower flows and powerhouse minimum flows precluded spilling 18 Kcfs. At Little Goose Dam the 30% spill was met, and a decision was made to spill a flat 11.6 Kcfs beginning August 18<sup>th</sup> for system stability. This spill level is to continue through August 31, 2009. At Lower Monumental dam the 17 Kcfs was not always met from August 14<sup>th</sup> to 17<sup>th</sup> due to low flows and powerhouse minimum requirements. At Ice Harbor Dam the court ordered levels of 45 Kcfs daytime spill and gas cap nighttime spill were often precluded due to low flows and required powerhouse minimum flows.

The following table shows the planned operations for summer spill levels in the lower Columbia River for 2009.

<b>Project</b>	<b>Day/Night Spill</b>
McNary	50%/50%* (beginning June 20)
John Day	30%/30%
The Dalles	40%/40%
Bonneville	75 Kcfs/gas cap

Flows in the lower River were generally low from August 14<sup>th</sup> to 17<sup>th</sup>, but the refill of Grand Coulee Reservoir during this period exacerbated the low flow levels. McNary Dam spill was below the 50% instantaneous during this period, with spill ranging from 35% to 42.8%. At John Day Dam the project is spilling an instantaneous 30%. At The Dalles Dam flows were below the level needed to spill 40% and meet powerhouse minimum flows. Spill ranged from 30.5 % to 37.4 % from August 15<sup>th</sup> to 18<sup>th</sup>. When flow increased the 40% level was met August 19<sup>th</sup> and 20<sup>th</sup>.

At Bonneville Dam all flow above the powerhouse minimum of about 30 Kcfs was spilled earlier in the week, with spill as low as 50 Kcfs at times. When flows increased on the 19<sup>th</sup> and the 20<sup>th</sup>, spill increased to a minimum of 75 Kcfs.

There were no exceedences of the 115%/120% TDG levels at the gages required for management of spill this past week. TDG registered slightly above 115% at the Camas/Washougal gage (08/18, 08/19 and 08/20). The total dissolved gas levels were due to the diel heating, and there is no water quality requirement to manage spill to this gage.

Gas bubble trauma (GBT) monitoring occurred at Little Goose and Lower Monumental dams in the Snake River, and at McNary and Bonneville dams in the lower Columbia. Over the past week no fish were detected with signs of GBT.

#### **Smolt Monitoring:**

Subyearling Chinook smolts continue to decline in numbers throughout the system. Unclipped subyearlings predominate at all the sites at this time suggesting that many of the late season outmigrant fish are of wild origin. It should be noted however, that a good portion of hatchery origin fish were unmarked as well.

At Lower Granite Dam subyearling Chinook predominated with coho smolt numbers second in prevalence but at very low numbers. Average daily passage index for subyearling Chinook was at 190 per day this week compared to 330 per day last week. At Little Goose Dam the subyearling Chinook indices decreased this week with the daily average index at 126 per day this week compared to 410 last week.

At Rock Island dam the daily passage indices for subyearling Chinook predominated in the sample, with indices averaging over 15 per day this week compared to 30 per day last week.

In the lower Columbia River subyearling Chinook smolt numbers declined again this week at McNary Dam. Subyearling Chinook passage indices dropped from nearly 5,000 per day last week to about 3,700 per day this week. At Bonneville Dam subyearling Chinook indices were down a little from last week; the index average just over 1,400 per day this week compared to over 1,700 per day last week.

#### **Hatchery Release:**

**Snake River Zone:** The Snake River Zone encompasses the Snake River and its tributaries from its confluence with the Columbia River to Hells Canyon Dam. There were no releases of juvenile salmonids

scheduled for this week. Furthermore, no releases of juvenile salmonids are scheduled to begin over the next two weeks.

**Mid-Columbia Zone:** The Mid-Columbia Zone encompasses the area of the Columbia River and its tributaries from McNary Dam to Chief Joseph Dam. There were no scheduled releases of juvenile salmonids to this zone this week. There are no releases of juvenile salmonids to this zone over the next two weeks.

**Lower Columbia Zone:** The Lower Columbia Zone is defined as the Columbia River and its tributaries from Bonneville Dam to McNary Dam. No releases of juvenile salmonids were scheduled for this zone over the past week. Furthermore, there are no releases scheduled for this zone over the next two weeks.

#### **Adult Passage:**

Fall Chinook began to pass Bonneville Dam on August 1<sup>st</sup>. Daily counts of adult fall Chinook ranged from 1425 to 2501. The 2009 adult fall Chinook count of 25283 was about 1.96 times greater than the 2008 count and about 1.79 times greater than the 10 year average. The fall Chinook jack count of 6414 was about 2.23 times greater than the 2008 count and about 3.24 times greater than the 10 year average. The adult fall Chinook count total at The Dalles Dam of 14883 is about 58.8% of the Bonneville passage to date.

Daily steelhead counts at Bonneville Dam for the past week ranged between 9134 and 25059. The daily adult steelhead count of 34053 on 8/13/09 was the highest recorded adult daily steelhead count at Bonneville Dam (date range searched was 1977 through 2009). Prior to this, the 2<sup>nd</sup> highest adult daily steelhead count at Bonneville Dam occurred on August 3<sup>rd</sup>, 2001 when a total of 14432 adult steelhead were counted. The Bonneville Dam 2009 steelhead count of 376758 is about 1.81 times greater than the 2008 count and 1.82 times greater than the 10 year average.

During this time of year, there are times when there are higher steelhead counts at upstream projects compared to downstream projects. The higher counts of steelhead at upstream sites compared to downstream sites in any particular year is because some steelhead spend the winter between sites, for instance between Ice Harbor and Lower Granite, and then start their migration upstream the following year. The summer steelhead run is delineated according to dates of passage past Bonneville Dam and is made up of two components. A-run steelhead pass Bonneville Dam from the first of June through August 25<sup>th</sup> and B-run steelhead pass Bonneville from August 26<sup>th</sup> through

October. A-run summer steelhead pass Bonneville Dam through August 25th. As of August 20th, the 2009 A-run adult steelhead count at Bonneville was 372250 which was about 1.82 times greater than the 2008 count of 204485 and was about 2 times greater than the 10 year average count of 185839.

In the Snake River, this year's Lower Granite total steelhead count of 20241 is about 97.5% of the 2008 count of 20748 and 1.41 times greater than the 10 year average of 14389. The 2009 wild steelhead count as of August 20th was 6817. At Rock Island Dam, as of August 18th, 4781 adult steelhead had been counted and at Rocky Reach Dam, 3821 adult steelhead had been counted so far this season. At Willamette Falls Dam, the 2009 count for steelhead was 17126, as of August 19th. This year's steelhead count is only about 91.8% of the 2008 count of 18646 at Willamette Falls Dam for the same date range.

The 2009 adult sockeye count at Bonneville Dam of 177808 is about 83.2% of the 2008 count of 213586 and about 2.26 times greater than the 10 year average of 78589. In the upper Columbia River at Priest Rapids Dam, the 2009 adult sockeye count of 153436 was about 77.9% of the 2008 count and 2.05 times greater than the 10 year average. Two of the major spawning sites for sockeye in the upper Columbia River zone are Lake Wenatchee and Lake Osoyoos (Okanogan basin). In the Snake River at Lower Granite Dam the 2009 adult sockeye count of 1214 was about 1.37 times greater than the 2008 count of 886 and 9.63 times greater than the 10 year average count of 126.

The 2009 adult coho count at Bonneville Dam is 3861 adults and 906 jacks. The Bonneville 2009 adult coho count has 3700 more adult coho than 2008 and 3408 more adult coho salmon than the 10 year average. Five chum and one pink salmon have been observed at Bonneville Dam so far this season. In 2008, 5 chum and 59 pink salmon had been observed by this date. As of August 13th at Bonneville Dam, the adult Shad count was 1373679 which was about 64.0% of the 2008 count of 2144339 and only about 44.0% of the 10 year average count of 3118272.

The posting of the daily fish counts have been delayed several days this week on the Corp of Engineers website due to computer problems. The COE is working on fixing the problems. FPC staff called project count stations and requested fish count data. The counts for BON, TDA, JDA, LGS, LMN and LGR have been updated with the data we have received over the phone from the COE fish counters.

The data for 8/20 at these sites are preliminary data.



**Daily Average Flow and Spill (in kcfs) at Mid-Columbia Projects**

Date	Grand Coulee		Chief Joseph		Wells		Rocky Reach		Rock Island		Wanapum		Priest Rapids	
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
08/07/2009	74.4	0.1	71.7	0.0	79.4	6.0	81.6	7.4	82.5	19.0	98.6	19.6	99.6	23.2
08/08/2009	55.8	0.1	58.4	0.0	57.6	4.5	57.8	5.5	57.2	13.8	53.8	18.8	58.7	21.4
08/09/2009	55.3	0.2	59.6	0.0	59.4	5.2	55.0	5.0	52.9	12.4	55.6	19.1	51.1	22.7
08/10/2009	88.9	0.1	82.9	0.0	83.3	6.3	82.8	7.0	83.9	16.3	87.9	19.4	76.3	22.4
08/11/2009	81.6	0.1	86.1	0.0	90.7	7.4	89.2	6.6	89.1	15.4	90.1	20.0	87.1	23.4
08/12/2009	70.1	0.2	66.9	0.0	68.8	6.5	68.2	6.6	68.7	16.3	84.9	19.6	88.9	23.0
08/13/2009	55.4	0.2	60.7	0.0	63.7	6.2	62.7	6.3	64.4	12.6	66.9	19.4	60.0	22.0
08/14/2009	64.5	0.2	59.7	0.0	58.3	5.0	60.6	4.9	59.3	11.7	55.0	19.7	50.7	22.7
08/15/2009	44.2	0.1	44.1	0.0	48.8	4.6	48.8	0.0	49.1	10.0	54.3	20.1	46.9	23.6
08/16/2009	49.9	0.2	52.0	0.0	49.2	3.9	46.7	0.0	47.6	9.4	52.5	20.2	47.2	22.9
08/17/2009	76.8	0.1	76.7	0.0	82.4	6.8	82.4	0.0	82.3	15.1	85.4	20.1	82.7	23.9
08/18/2009	90.9	0.1	89.2	0.0	88.4	6.3	87.3	0.0	87.7	0.0	91.1	20.0	82.3	23.6
08/19/2009	88.3	0.1	88.8	0.0	95.5	7.6	92.8	0.0	90.9	0.0	100.1	8.0	97.5	24.0
08/20/2009	80.2	0.2	85.8	0.0	85.0	5.8	85.3	7.1	86.9	0.0	93.8	2.0	90.2	9.1

**Daily Average Flow and Spill (in kcfs) at Snake Basin Projects**

Date	Dworshak		Hells Brownlee Canyon		Lower Granite		Little Goose		Lower Monumental		Ice Harbor	
	Flow	Spill	Inflow	Outflow	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
08/07/2009	9.9	0.0	10.1	8.7	31.5	18.8	30.7	9.2	29.7	17.4	31.4	21.2
08/08/2009	10.0	0.0	11.6	8.4	31.6	18.9	30.3	9.1	29.5	17.3	32.1	21.6
08/09/2009	10.0	0.0	13.0	9.5	34.3	18.6	33.8	9.9	33.3	17.5	34.4	24.1
08/10/2009	10.0	0.0	13.1	11.5	34.6	23.9	33.7	9.9	32.8	17.1	34.3	24.3
08/11/2009	10.0	0.0	12.3	12.4	34.3	23.8	33.7	9.9	32.1	17.4	33.0	22.8
08/12/2009	10.0	0.0	12.3	12.4	33.2	24.0	33.7	9.9	32.0	17.2	33.1	23.0
08/13/2009	10.1	0.0	10.3	9.4	34.6	24.4	33.7	9.9	31.9	17.5	33.7	23.5
08/14/2009	10.1	0.0	10.6	8.4	28.7	19.8	26.6	8.1	26.5	14.4	28.0	18.3
08/15/2009	10.1	0.0	9.4	8.3	29.6	16.7	28.6	8.6	27.3	15.3	27.5	20.5
08/16/2009	10.1	0.0	9.1	9.5	29.8	16.8	29.3	8.7	28.4	15.9	30.7	23.8
08/17/2009	10.1	0.0	10.7	11.5	30.5	17.6	28.5	8.9	28.8	16.6	29.4	22.4
08/18/2009	11.1	0.9	9.8	13.1	34.5	18.8	33.9	11.3	31.6	17.2	33.6	26.6
08/19/2009	12.1	1.9	9.9	14.0	35.0	18.6	34.6	11.6	33.2	17.4	34.5	27.8
08/20/2009	12.1	1.9	---	---	36.3	18.5	35.7	11.6	33.5	17.4	35.7	28.9

**Daily Average Flow and Spill (in kcfs) at Lower Columbia Projects**

Date	McNary		John Day		The Dalles		Bonneville			
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	PH1	PH2
08/07/2009	124.8	61.1	120.4	36.1	115.0	45.9	116.8	73.9	0.0	30.7
08/08/2009	125.6	61.6	104.2	31.3	96.6	38.6	106.6	64.0	0.0	30.5
08/09/2009	110.0	54.6	103.1	30.9	100.2	40.0	113.0	70.3	0.0	30.7
08/10/2009	108.1	52.0	99.2	30.0	102.6	40.9	113.1	70.2	0.0	30.9
08/11/2009	110.2	53.8	101.8	30.5	96.0	38.2	113.2	70.1	0.0	31.1
08/12/2009	122.2	59.3	113.0	34.0	111.1	44.5	118.3	75.2	0.0	31.0
08/13/2009	117.7	57.5	112.9	33.9	110.5	44.2	125.8	83.2	0.1	30.4
08/14/2009	97.8	41.9	97.2	29.5	96.9	38.7	110.4	67.8	0.0	30.6
08/15/2009	91.8	36.4	91.3	27.3	90.0	32.4	102.6	60.0	0.0	30.5
08/16/2009	92.8	37.4	87.6	26.2	87.9	31.1	100.2	57.5	0.0	30.7
08/17/2009	85.8	30.0	80.6	24.2	81.3	24.8	93.1	50.5	0.0	30.5
08/18/2009	107.9	52.2	98.4	29.7	90.2	33.7	93.3	50.5	0.0	30.7
08/19/2009	130.5	65.4	119.7	36.1	114.3	45.8	120.3	72.3	0.0	35.9
08/20/2009	142.4	71.1	135.9	40.8	132.7	53.0	142.3	80.2	0.0	50.0

## Gas Bubble Trauma Monitoring Results from Representative Sites on the Snake River and Columbia River

Site	Date	Species	Number of Fish	Number w GBT signs	Number w Fin Signs	% Fin GBT	% Severe Fin GBT	Number of Fish with Fin GBT Listed by Highest Rank			
								Rank 1	Rank 2	Rank 3	Rank 4
<b>Little Goose Dam</b>											
	08/11/09	Chinook + Steelhead	10	0	0	0.00%	0.00%	0	0	0	0
	08/17/09	Chinook + Steelhead	2	0	0	0.00%	0.00%	0	0	0	0
<b>Lower Monumental Dam</b>											
	08/12/09	Chinook + Steelhead	2	0	0	0.00%	0.00%	0	0	0	0
	08/18/09	Chinook + Steelhead	1	0	0	0.00%	0.00%	0	0	0	0
<b>McNary Dam</b>											
	08/13/09	Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	08/17/09	Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
<b>Bonneville Dam</b>											
	08/11/09	Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	08/15/09	Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	08/15/09	Chinook + Steelhead	83	0	0	0.00%	0.00%	0	0	0	0

## Total Dissolved Gas Saturation (%) - Average of 12 Highest Hours, 24 h Average and 24 h High

### Total Dissolved Gas Saturation Data at Upper Columbia River Sites

Date	<u>Hungry H. Dnst</u>			#	<u>Boundary</u>			#	<u>Grand Coulee</u>			#	<u>Grand C. Tlwr</u>			#	<u>Chief Joseph</u>			#
	<u>24 h</u>	<u>12 h</u>	<u>High</u>		<u>24 h</u>	<u>12 h</u>	<u>High</u>		<u>24 h</u>	<u>12 h</u>	<u>High</u>		<u>24 h</u>	<u>12 h</u>	<u>High</u>		<u>24 h</u>	<u>12 h</u>	<u>High</u>	
	<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>		
8/7	104.9	105.8	106.1	24	106.6	106.9	107.2	23	107.8	108.0	108.3	24	107.8	109.0	112.6	23	108.5	108.8	109.3	24
8/8	103.8	104.5	104.9	24	105.9	106.4	107.0	22	107.1	107.2	107.6	24	108.0	109.3	112.2	22	107.5	107.9	108.3	24
8/9	104.2	104.4	104.5	24	106.7	107.7	108.4	23	106.9	107.0	107.2	24	107.9	108.7	110.7	23	107.4	108.1	108.7	24
8/10	104.3	104.8	105.1	24	107.5	108.2	109.0	23	106.8	107.0	107.2	24	108.6	109.6	111.6	23	107.2	107.6	107.8	24
8/11	104.5	105.1	105.6	24	106.6	106.9	107.3	23	106.6	106.8	107.2	24	106.7	107.6	110.1	23	107.6	108.0	108.3	24
8/12	104.6	104.9	105.2	24	105.5	105.9	106.3	24	106.6	106.8	107.0	24	106.2	107.5	110.1	24	107.9	107.9	108.1	6
8/13	104.0	104.5	104.7	24	105.2	105.6	106.5	22	106.7	106.8	106.9	24	104.5	105.4	106.1	22	---	---	---	0
8/14	103.1	103.4	103.6	24	105.4	105.9	106.3	22	105.8	106.0	106.3	24	104.1	105.1	108.0	22	106.7	106.7	106.9	4
8/15	103.6	103.8	103.9	24	104.1	104.4	104.8	23	105.6	105.8	106.1	24	103.6	104.5	106.4	23	106.3	106.6	107.1	24
8/16	103.2	103.4	103.8	24	103.7	104.1	104.8	23	105.2	105.4	105.8	24	104.7	105.3	106.1	23	106.7	107.3	107.7	24
8/17	103.1	103.4	103.6	24	103.6	104.4	105.0	23	105.0	105.5	106.1	24	104.3	105.1	106.5	23	106.8	107.3	107.6	24
8/18	103.6	104.1	104.5	24	104.3	105.1	106.1	23	104.7	104.9	105.4	24	104.7	105.8	108.3	23	107.4	107.9	108.5	24
8/19	103.7	104.2	104.8	24	104.8	105.5	106.8	22	104.7	105.2	106.0	24	104.2	105.0	106.3	22	108.4	109.2	109.7	24
8/20	103.7	104.2	104.7	24	104.8	105.4	106.7	22	105.0	105.5	106.2	24	103.7	104.6	106.7	22	107.9	108.2	108.7	24

### Total Dissolved Gas Saturation Data at Mid Columbia River Sites

Date	<u>Chief J. Dnst</u>			#	<u>Wells</u>			#	<u>Wells Dwnstrm</u>			#	<u>Rocky Reach</u>			#	<u>Rocky R. Tlwr</u>			#
	<u>24 h</u>	<u>12 h</u>	<u>High</u>		<u>24 h</u>	<u>12 h</u>	<u>High</u>		<u>24 h</u>	<u>12 h</u>	<u>High</u>		<u>24 h</u>	<u>12 h</u>	<u>High</u>		<u>24 h</u>	<u>12 h</u>	<u>High</u>	
	<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>		
8/7	108.7	109.0	109.9	24	110.6	111.4	112.7	24	112.0	112.8	113.5	24	109.9	110.1	110.3	24	109.2	110.2	111.1	24
8/8	108.2	109.0	110.0	24	109.1	109.9	110.8	24	110.4	111.5	112.4	24	109.0	109.4	109.9	24	108.0	108.7	109.4	24
8/9	107.6	108.4	109.6	24	108.8	109.6	110.4	24	110.6	111.5	112.8	24	109.6	110.1	110.6	24	108.2	108.9	109.2	24
8/10	107.0	107.5	108.3	24	108.2	108.6	109.0	24	109.8	110.6	111.2	24	109.9	110.1	110.3	23	109.5	110.6	111.6	23
8/11	108.0	108.4	109.0	24	107.2	107.5	107.7	24	109.2	109.7	110.1	24	109.3	109.5	109.9	24	109.4	109.8	110.3	24
8/12	108.4	108.4	108.9	6	107.0	107.7	108.4	23	109.0	109.5	109.8	23	108.5	108.8	109.2	24	108.6	109.0	109.5	24
8/13	---	---	---	0	107.5	108.2	109.0	24	109.3	110.2	111.0	24	108.1	108.4	108.9	24	108.0	108.4	108.9	24
8/14	106.2	106.2	106.3	4	107.3	107.8	108.4	24	108.9	109.6	110.2	24	106.9	107.3	107.7	24	107.1	107.3	107.5	24
8/15	106.5	107.2	108.1	24	107.7	108.8	109.5	24	109.6	110.5	111.1	24	106.6	107.0	107.6	24	105.0	105.2	105.8	24
8/16	106.7	107.2	108.1	24	106.9	107.9	108.7	24	108.6	109.6	110.9	24	106.8	107.6	108.1	24	103.7	104.0	104.4	24
8/17	106.7	107.5	108.3	24	107.3	108.3	109.1	24	109.1	110.1	110.8	24	107.6	108.3	109.0	22	104.7	105.3	105.9	22
8/18	107.1	107.5	108.4	24	108.0	109.1	109.6	24	110.0	111.0	111.4	24	109.4	110.1	110.9	24	106.4	107.6	108.1	24
8/19	108.0	109.1	109.6	24	108.5	109.4	110.3	24	110.7	111.7	112.2	24	109.5	110.1	110.5	24	107.1	107.9	108.2	24
8/20	108.1	108.5	109.0	24	109.2	110.7	111.2	24	111.1	112.3	112.8	24	109.7	110.4	111.2	24	109.0	110.2	110.6	24

### Total Dissolved Gas Saturation at Mid Columbia River Sites

Date	<u>Rock Island</u>			#	<u>Rock I. Tlwr</u>			#	<u>Wanapum</u>			#	<u>Wanapum Tlwr</u>			#	<u>Priest Rapids</u>			#
	<u>24 h</u>	<u>12 h</u>	<u>High</u>		<u>24 h</u>	<u>12 h</u>	<u>High</u>		<u>24 h</u>	<u>12 h</u>	<u>High</u>		<u>24 h</u>	<u>12 h</u>	<u>High</u>		<u>24 h</u>	<u>12 h</u>	<u>High</u>	
	<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>		
8/7	109.1	109.5	110.3	24	114.1	114.8	115.9	24	108.4	109.1	109.5	24	112.5	113.6	115.1	24	108.1	109.0	109.5	24
8/8	109.0	109.5	110.0	24	114.6	116.0	117.1	24	107.5	108.0	108.3	24	114.8	115.7	116.5	24	108.5	109.1	109.4	24
8/9	109.0	109.5	109.7	24	114.4	116.2	118.4	24	106.1	106.9	107.2	24	114.5	115.8	116.5	24	108.7	110.0	111.4	24
8/10	110.2	110.5	111.2	23	114.3	115.3	118.4	23	106.9	107.4	108.1	24	113.0	114.2	116.6	24	110.9	112.1	113.3	24
8/11	109.9	110.3	110.9	24	114.1	115.4	119.3	24	107.6	108.5	109.1	24	113.6	115.2	116.4	24	111.1	111.6	112.2	24
8/12	109.6	109.7	109.9	24	114.9	116.3	120.5	24	107.9	108.5	108.7	24	113.7	115.2	116.5	24	110.9	111.4	112.1	24
8/13	108.8	109.2	109.6	24	114.0	115.6	119.4	24	106.9	107.7	108.0	24	114.0	115.4	116.2	24	109.5	110.2	111.5	24
8/14	107.5	107.7	107.9	24	113.1	114.5	116.8	24	104.8	105.4	105.6	24	114.9	115.2	115.6	24	106.9	107.4	108.1	24
8/15	106.8	107.3	107.8	24	111.7	113.6	116.6	24	104.7	105.6	106.1	24	114.9	115.8	116.4	24	106.2	107.0	107.9	24
8/16	106.6	107.3	108.1	24	111.9	113.7	115.6	24	105.2	105.2	105.4	3	113.8	113.8	115.2	3	106.3	106.3	106.5	3
8/17	107.1	107.5	107.9	22	112.5	113.5	117.4	22	108.7	111.0	111.5	24	113.4	114.1	115.4	22	112.9	114.4	115.6	24
8/18	108.6	109.5	110.4	24	108.8	109.9	112.4	24	109.5	110.5	110.9	24	---	---	---	0	114.1	114.4	115.0	24
8/19	109.8	110.1	110.4	24	109.5	109.9	110.2	24	---	---	---	0	---	---	---	0	---	---	---	0
8/20	109.8	110.4	111.0	24	109.6	110.1	110.7	24	---	---	---	0	---	---	---	0	---	---	---	0

## Total Dissolved Gas Saturation (%) - Average of 12 Highest Hours, 24 h Average and 24 h High

### Total Dissolved Gas Saturation Data at Lower Columbia and Snake River Sites

Date	<u>Priest R. Dnst</u>			<u>Pasco</u>			<u>Dworshak</u>			<u>Clwrtr-Peck</u>			<u>Anatone</u>			#				
	<u>24 h</u>	<u>12 h</u>		<u>24 h</u>	<u>12 h</u>		<u>24 h</u>	<u>12 h</u>		<u>24 h</u>	<u>12 h</u>		<u>24 h</u>	<u>12 h</u>						
	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High					
8/7	109.9	110.5	111.0	24	104.4	105.3	106.0	24	100.1	100.4	100.5	24	101.9	102.4	103.0	24	100.3	101.0	101.8	24
8/8	110.2	110.7	111.6	24	104.7	105.7	106.3	24	99.8	100.0	100.4	24	102.1	103.1	104.2	24	101.3	102.8	104.1	24
8/9	110.2	110.9	111.5	24	106.0	107.1	107.8	24	99.9	100.2	100.5	24	102.4	103.6	104.7	24	101.9	103.2	104.4	24
8/10	111.5	112.6	113.6	24	106.1	107.0	107.6	24	100.0	100.3	100.7	24	102.4	103.8	104.9	24	101.7	102.9	103.9	24
8/11	112.2	113.1	113.5	24	106.7	107.7	108.3	24	100.1	100.5	100.8	24	102.4	103.8	104.9	24	101.7	102.8	104.0	24
8/12	112.3	112.8	113.3	24	107.3	107.9	108.5	24	100.0	100.2	100.4	24	102.1	103.2	103.9	24	101.1	101.9	102.5	24
8/13	111.4	112.1	112.8	24	107.2	107.9	108.6	24	100.0	100.2	100.5	24	101.8	102.5	103.9	24	101.0	101.7	102.7	24
8/14	109.7	110.2	111.0	24	105.4	105.9	106.5	24	99.9	100.1	100.2	24	101.5	102.2	102.9	24	100.6	101.3	102.3	24
8/15	109.6	110.4	111.0	24	104.5	105.1	105.6	24	99.8	99.9	100.1	24	101.5	102.3	102.8	24	101.0	102.2	103.1	24
8/16	109.1	109.1	109.2	3	105.1	105.7	106.2	24	99.8	100.1	100.5	24	101.7	102.7	103.8	24	101.3	102.4	103.4	24
8/17	112.5	114.2	115.0	24	106.1	107.1	107.6	24	99.9	100.1	100.4	24	101.8	102.9	103.9	23	101.6	103.0	104.2	24
8/18	113.8	114.6	115.4	24	107.8	109.4	110.2	24	101.9	103.9	104.7	24	102.9	104.7	106.3	24	102.2	103.5	104.7	24
8/19	---	---	---	0	109.7	110.5	110.9	24	104.0	104.3	104.6	24	104.5	105.6	106.6	24	102.3	103.6	105.0	24
8/20	---	---	---	0	109.8	110.7	111.2	24	104.1	104.3	104.6	24	104.7	105.8	106.8	24	102.2	103.5	104.7	24

### Total Dissolved Gas Saturation Data at Snake River Sites

Date	<u>Clwrtr-Lewiston</u>			<u>Lower Granite</u>			<u>L. Granite Tlwr</u>			<u>Little Goose</u>			<u>L. Goose Tlwr</u>			#				
	<u>24 h</u>	<u>12 h</u>		<u>24 h</u>	<u>12 h</u>		<u>24 h</u>	<u>12 h</u>		<u>24 h</u>	<u>12 h</u>		<u>24 h</u>	<u>12 h</u>						
	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High					
8/7	102.0	102.8	103.9	20	103.6	103.8	103.9	24	111.6	111.7	112.0	24	107.4	107.8	108.3	24	111.3	111.9	112.2	24
8/8	102.6	104.7	106.2	24	102.7	103.0	103.2	24	111.6	111.8	112.0	24	106.0	106.3	106.7	24	111.2	111.6	112.1	24
8/9	103.3	105.4	107.1	23	102.5	102.6	102.9	24	111.1	111.4	112.0	24	105.4	105.5	105.7	24	111.1	111.4	111.6	24
8/10	103.5	105.6	107.3	23	101.2	101.5	102.1	24	112.9	114.6	115.5	24	105.4	105.6	105.8	24	110.9	111.2	111.4	24
8/11	103.4	105.5	107.1	23	100.4	100.6	100.8	24	112.7	114.3	115.8	24	105.4	105.6	105.8	24	111.0	111.5	111.8	24
8/12	102.6	104.0	105.4	23	100.6	100.7	100.9	24	113.0	114.5	115.4	24	105.4	105.8	107.0	24	110.5	110.9	111.3	24
8/13	102.4	103.6	104.8	22	101.8	102.2	102.5	24	112.8	114.8	115.3	24	107.2	107.5	107.7	24	111.2	111.5	111.8	24
8/14	101.7	103.0	104.0	24	100.7	101.0	102.0	24	112.5	114.2	114.7	24	107.2	107.3	107.5	24	111.0	111.2	111.3	24
8/15	102.0	103.7	105.1	24	100.3	100.5	100.6	24	110.7	110.9	111.3	24	106.4	106.8	107.2	24	109.3	110.9	111.3	24
8/16	102.7	104.5	106.3	22	100.1	100.2	100.7	24	110.6	110.8	110.9	24	105.7	105.8	105.9	24	107.2	107.6	107.8	24
8/17	102.7	104.8	106.4	24	99.4	99.5	99.6	24	110.7	110.9	111.2	24	105.3	105.4	105.5	24	107.5	108.4	110.8	24
8/18	103.0	105.0	106.5	23	99.5	99.7	99.7	24	110.7	111.1	111.6	24	105.6	105.9	106.4	24	110.2	112.5	113.1	24
8/19	103.8	105.9	107.5	24	100.0	100.3	100.6	24	110.8	111.1	111.3	24	105.9	106.2	106.4	24	112.7	113.0	113.3	24
8/20	104.2	106.3	107.8	24	100.8	101.1	101.6	24	110.4	110.9	111.6	24	105.9	106.2	106.9	24	112.3	112.8	113.2	24

### Total Dissolved Gas Saturation Data at Snake and Lower Columbia River Sites

Date	<u>Lower Mon.</u>			<u>L. Mon. Tlwr</u>			<u>Ice Harbor</u>			<u>Ice Harbor Tlwr</u>			<u>McNary-Oregon</u>			#				
	<u>24 h</u>	<u>12 h</u>		<u>24 h</u>	<u>12 h</u>		<u>24 h</u>	<u>12 h</u>		<u>24 h</u>	<u>12 h</u>		<u>24 h</u>	<u>12 h</u>						
	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High					
8/7	107.2	107.7	108.1	24	114.9	115.0	115.2	24	109.1	110.0	111.5	24	112.7	113.0	113.6	24	---	---	---	0
8/8	105.7	106.2	106.6	24	115.3	115.5	115.6	24	107.3	107.8	108.4	24	112.6	113.2	113.7	24	---	---	---	0
8/9	105.8	105.9	106.2	24	115.3	115.4	115.6	24	106.8	107.0	107.3	24	113.2	113.8	114.1	24	---	---	---	0
8/10	105.0	105.3	105.7	24	115.0	115.3	115.7	24	106.6	106.7	106.9	24	112.7	113.3	113.6	24	---	---	---	0
8/11	105.5	105.8	106.4	24	115.7	116.0	116.2	24	106.8	107.0	107.5	24	112.4	112.8	112.9	24	---	---	---	0
8/12	106.0	106.3	106.4	24	115.6	115.8	116.0	24	107.8	108.3	108.7	24	112.5	113.0	113.4	24	---	---	---	0
8/13	106.4	106.6	107.0	24	115.6	115.7	115.9	24	108.6	108.8	109.1	24	113.2	113.6	114.0	24	---	---	---	0
8/14	105.7	106.2	106.5	24	114.3	115.6	115.7	24	108.4	108.9	109.4	24	111.7	112.8	113.3	24	---	---	---	0
8/15	105.3	105.7	106.2	24	114.4	115.7	116.0	24	107.6	108.0	108.3	24	111.4	112.0	112.7	24	---	---	---	0
8/16	105.0	105.2	105.3	24	114.9	115.9	116.1	24	107.5	107.8	108.1	24	112.3	112.5	112.8	24	---	---	---	0
8/17	104.7	105.0	105.1	24	115.1	115.9	116.1	24	107.8	108.0	108.1	24	112.0	112.5	112.9	24	---	---	---	0
8/18	105.6	106.1	106.7	24	115.6	115.9	116.1	24	108.7	108.9	109.4	24	113.1	113.7	114.1	24	---	---	---	0
8/19	106.7	107.4	108.0	24	115.8	116.0	116.2	24	110.0	110.6	111.6	24	113.3	114.0	114.8	24	---	---	---	0
8/20	107.2	107.4	107.8	24	115.2	115.6	115.9	24	111.7	112.0	112.5	24	113.6	114.4	115.0	24	---	---	---	0



## Total Dissolved Gas Saturation (%) - Average of 12 Highest Hours, 24 h Average and 24 h High

### Total Dissolved Gas Saturation Data at Lower Columbia River Sites

Date	<u>McNary-Wash</u>			<u>McNary Tlwr</u>			<u>John Day</u>			<u>John Day Tlwr</u>			<u>The Dalles</u>							
	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24h</u>	<u>12h</u>	<u>#</u>	<u>24h</u>	<u>12h</u>	<u>#</u>	<u>24h</u>	<u>12h</u>	<u>#</u>					
	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	AVG	High					
8/7	105.2	105.7	106.3	24	117.5	120.8	139.1	24	102.7	103.1	103.5	24	113.7	114.1	114.4	24	102.6	102.8	102.9	24
8/8	103.4	103.6	103.8	24	131.8	132.0	132.2	24	100.9	101.1	101.3	24	112.9	113.8	114.5	24	101.7	102.0	102.2	24
8/9	102.2	102.5	102.9	24	131.6	131.7	131.9	24	100.2	100.4	100.5	24	112.6	113.3	113.8	24	102.5	103.2	103.6	24
8/10	101.8	102.3	102.7	24	126.1	138.0	147.8	24	99.8	99.9	100.1	24	112.7	113.3	113.9	24	104.2	104.8	105.0	24
8/11	103.4	104.3	105.2	24	115.4	115.7	116.1	24	99.6	99.8	100.0	24	113.1	113.6	113.9	24	105.0	105.3	105.6	24
8/12	104.1	104.5	104.8	24	115.3	116.1	116.6	24	99.6	99.8	99.9	24	113.3	114.1	114.3	24	105.2	105.4	105.7	24
8/13	104.9	105.1	105.3	24	115.5	116.4	116.6	24	99.7	99.9	100.0	24	113.5	114.0	114.1	24	104.7	105.0	105.3	24
8/14	104.2	104.6	105.1	24	115.1	116.0	116.0	24	99.3	99.4	99.5	24	112.5	112.8	113.3	24	103.0	103.3	103.7	24
8/15	103.4	103.5	103.7	24	114.6	115.3	115.7	24	99.2	99.4	99.6	24	111.7	112.2	112.9	24	102.5	102.8	103.0	24
8/16	103.3	103.5	103.9	24	114.7	115.3	115.6	24	99.3	99.6	100.0	24	111.5	111.9	112.4	24	103.0	103.4	103.8	24
8/17	103.6	103.8	104.2	24	114.2	114.4	114.6	24	99.6	100.1	100.7	24	111.0	111.5	112.0	24	104.6	105.5	105.9	24
8/18	104.4	105.0	105.9	24	114.8	115.7	116.2	24	100.8	101.3	101.6	24	113.0	114.1	114.5	24	107.0	107.5	107.7	24
8/19	106.0	107.2	109.8	24	116.5	117.0	117.5	24	101.8	102.1	102.7	24	113.4	113.9	114.3	24	107.9	108.4	108.8	24
8/20	107.9	108.4	109.1	24	116.0	116.7	117.8	24	104.6	105.8	106.7	24	113.7	114.5	116.6	24	108.0	108.4	108.7	24

### Total Dissolved Gas Saturation Data at Lower Columbia River Sites

Date	<u>The Dalles Dnst</u>			<u>Bonneville</u>			<u>Warrendale</u>			<u>Camas\Washougal</u>			<u>Cascade Island</u>							
	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24h</u>	<u>12h</u>	<u>#</u>	<u>24h</u>	<u>12h</u>	<u>#</u>	<u>24h</u>	<u>12h</u>	<u>#</u>					
	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	AVG	High					
8/7	110.6	110.8	111.1	24	101.9	102.4	103.0	24	---	---	---	0	110.7	111.5	112.2	24	113.4	114.5	116.4	24
8/8	110.8	111.0	111.2	24	100.9	101.0	101.3	24	---	---	---	0	112.2	113.5	114.2	24	112.2	112.3	112.8	24
8/9	111.4	111.7	111.9	24	101.1	101.3	101.7	24	---	---	---	0	114.8	115.8	116.7	24	112.6	112.8	112.9	24
8/10	112.0	112.5	112.9	24	102.2	102.7	103.6	24	---	---	---	0	114.7	115.9	116.7	24	112.7	112.9	113.1	24
8/11	112.2	112.5	112.8	24	104.0	104.4	104.9	24	---	---	---	0	114.8	115.4	115.7	24	112.7	112.9	113.0	24
8/12	112.2	112.4	112.6	24	105.0	105.3	105.5	24	---	---	---	0	113.2	113.9	114.2	24	113.4	114.2	118.8	24
8/13	111.5	111.8	112.0	24	104.8	105.2	105.5	24	---	---	---	0	112.2	113.5	114.4	24	113.7	114.7	117.6	24
8/14	110.4	110.6	110.9	24	103.5	103.8	104.2	24	---	---	---	0	111.4	111.9	112.7	24	112.2	112.5	112.8	24
8/15	109.1	109.7	110.2	24	102.6	102.7	102.9	24	---	---	---	0	111.5	111.9	112.4	24	113.4	114.1	115.2	24
8/16	108.8	109.3	109.5	24	102.2	102.3	102.5	24	---	---	---	0	112.0	113.1	113.6	24	113.3	113.7	115.2	24
8/17	110.0	110.7	111.1	24	102.8	103.2	103.7	24	---	---	---	0	113.2	114.2	114.8	24	112.1	112.4	113.1	24
8/18	112.4	113.6	114.1	24	104.7	105.4	106.0	24	---	---	---	0	115.7	116.8	117.4	24	112.1	112.4	113.0	24
8/19	114.5	114.8	115.2	24	107.2	108.1	108.5	24	---	---	---	0	116.7	117.5	117.9	24	113.9	114.9	117.2	24
8/20	114.0	114.5	114.7	24	108.4	108.7	109.0	24	---	---	---	0	115.3	116.1	117.6	24	114.5	115.3	117.0	24

Two-Week Summary of Passage Indices

COMBINED YEARLING CHINOOK											
Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO2 (INDEX)
08/07/2009 *	---	---	---	---	0	0	0	0	0	14	---
08/08/2009 *	---	---	---	---	0	0	0	0	0	---	0
08/09/2009 *	---	---	---	---	0	0	0	0	0	---	---
08/10/2009 *	---	---	---	---	0	0	0	0	0	---	0
08/11/2009 *	---	---	---	---	0	0	0	0	0	7	---
08/12/2009 *	---	---	---	---	0	0	0	0	0	---	0
08/13/2009 *	---	---	---	---	0	0	0	0	0	---	---
08/14/2009 *	---	---	---	---	0	0	7	0	0	0	0
08/15/2009 *	---	---	---	---	0	0	0	0	0	---	---
08/16/2009 *	---	---	---	---	0	0	0	0	0	---	0
08/17/2009 *	---	---	---	---	0	0	0	0	0	---	---
08/18/2009 *	---	---	---	---	0	0	0	0	0	0	0
08/19/2009 *	---	---	---	---	0	0	0	0	0	---	0
08/20/2009 *	---	---	---	---	0	0	0	0	0	---	0
08/21/2009	---	---	---	---	---	---	---	---	---	---	---
<b>Total:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>0</b>
<b># Days:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>4</b>	<b>8</b>
<b>Average:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>
<b>YTD</b>	<b>37,667</b>	<b>44,693</b>	<b>20,207</b>	<b>29,713</b>	<b>3,081,413</b>	<b>2,432,949</b>	<b>449,035</b>	<b>9,225</b>	<b>2,251,664</b>	<b>1,032,260</b>	<b>1,717,088</b>

COMBINED SUBYEARLING CHINOOK											
Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO2 (INDEX)
08/07/2009 *	---	---	---	---	385	1,198	142	55	9,851	1,300	---
08/08/2009 *	---	---	---	---	472	551	30	38	8,308	---	2,182
08/09/2009 *	---	---	---	---	416	192	42	33	3,336	---	---
08/10/2009 *	---	---	---	---	308	164	48	24	1,096	---	1,076
08/11/2009 *	---	---	---	---	288	200	32	32	2,603	1,066	---
08/12/2009 *	---	---	---	---	209	215	99	30	3,248	---	1,856
08/13/2009 *	---	---	---	---	236	367	166	30	7,194	---	---
08/14/2009 *	---	---	---	---	279	414	72	16	7,582	938	2,065
08/15/2009 *	---	---	---	---	258	170	14	9	1,774	---	---
08/16/2009 *	---	---	---	---	159	81	52	11	2,012	---	1,559
08/17/2009 *	---	---	---	---	136	96	37	20	2,233	---	---
08/18/2009 *	---	---	---	---	140	59	37	15	2,318	836	880
08/19/2009 *	---	---	---	---	170	46	18	19	6,411	---	1,278
08/20/2009 *	---	---	---	---	194	13	73	15	7,581	---	1,288
08/21/2009	---	---	---	---	---	---	---	---	---	---	---
<b>Total:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,650</b>	<b>3,766</b>	<b>862</b>	<b>347</b>	<b>65,547</b>	<b>4,140</b>	<b>12,184</b>
<b># Days:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>4</b>	<b>8</b>
<b>Average:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>261</b>	<b>269</b>	<b>62</b>	<b>25</b>	<b>4,682</b>	<b>1,035</b>	<b>1,523</b>
<b>YTD</b>	<b>0</b>	<b>18</b>	<b>15</b>	<b>545</b>	<b>994,610</b>	<b>1,179,280</b>	<b>432,783</b>	<b>8,055</b>	<b>3,617,663</b>	<b>1,503,899</b>	<b>4,295,937</b>

### Two-Week Summary of Passage Indices

Date	COMBINED COHO											
	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO2 (INDEX)	
08/07/2009	*	---	---	---	---	10	42	0	0	0	0	---
08/08/2009	*	---	---	---	---	20	1	8	1	0	---	0
08/09/2009	*	---	---	---	---	20	4	0	0	0	---	---
08/10/2009	*	---	---	---	---	32	3	4	1	0	---	0
08/11/2009	*	---	---	---	---	13	7	0	0	0	0	---
08/12/2009	*	---	---	---	---	7	9	4	0	0	---	0
08/13/2009	*	---	---	---	---	88	7	40	1	10	---	---
08/14/2009	*	---	---	---	---	75	1	0	0	10	10	0
08/15/2009	*	---	---	---	---	48	1	2	0	0	---	---
08/16/2009	*	---	---	---	---	19	1	7	0	0	---	0
08/17/2009	*	---	---	---	---	9	6	0	0	0	---	---
08/18/2009	*	---	---	---	---	21	6	3	0	0	0	0
08/19/2009	*	---	---	---	---	38	11	0	0	0	---	0
08/20/2009	*	---	---	---	---	12	12	0	0	0	---	0
08/21/2009	*	---	---	---	---	---	---	---	---	---	---	---
<b>Total:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>412</b>	<b>111</b>	<b>68</b>	<b>3</b>	<b>20</b>	<b>10</b>	<b>0</b>
<b># Days:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>4</b>	<b>8</b>
<b>Average:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>8</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>0</b>
<b>YTD</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>332</b>	<b>92,065</b>	<b>80,968</b>	<b>18,940</b>	<b>37,588</b>	<b>127,100</b>	<b>240,419</b>	<b>503,265</b>

Date	COMBINED STEELHEAD											
	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO2 (INDEX)	
08/07/2009	*	---	---	---	---	0	1	0	0	0	0	---
08/08/2009	*	---	---	---	---	0	0	0	0	0	---	0
08/09/2009	*	---	---	---	---	0	0	0	0	0	---	---
08/10/2009	*	---	---	---	---	0	0	0	0	0	---	0
08/11/2009	*	---	---	---	---	0	0	0	0	0	0	---
08/12/2009	*	---	---	---	---	0	1	0	0	0	---	0
08/13/2009	*	---	---	---	---	0	1	0	3	0	---	---
08/14/2009	*	---	---	---	---	0	0	0	0	0	0	0
08/15/2009	*	---	---	---	---	0	0	0	0	0	---	---
08/16/2009	*	---	---	---	---	2	0	2	0	0	---	0
08/17/2009	*	---	---	---	---	0	0	0	0	0	---	---
08/18/2009	*	---	---	---	---	0	0	0	0	0	0	0
08/19/2009	*	---	---	---	---	0	2	0	0	0	---	0
08/20/2009	*	---	---	---	---	0	0	0	0	0	---	0
08/21/2009	*	---	---	---	---	---	---	---	---	---	---	---
<b>Total:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b># Days:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>4</b>	<b>8</b>
<b>Average:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>YTD</b>		<b>1,833</b>	<b>24,360</b>	<b>9,611</b>	<b>8,297</b>	<b>4,510,910</b>	<b>3,563,510</b>	<b>727,831</b>	<b>17,612</b>	<b>803,727</b>	<b>940,632</b>	<b>677,051</b>

## Two-Week Summary of Passage Indices

COMBINED SOCKEYE												
	WTB	IMN	GRN	LEW	LGR	LGS	LMN	RIS	MCN	JDA	BO2	
Date	(Coll)	(Coll)	(Coll)	(Coll)	(INDEX)	(INDEX)	(INDEX)	(INDEX)	(INDEX)	(INDEX)	(INDEX)	(INDEX)
08/07/2009	*	---	---	---	---	0	0	0	16	61	0	---
08/08/2009	*	---	---	---	---	0	0	0	6	0	---	0
08/09/2009	*	---	---	---	---	0	0	0	1	0	---	---
08/10/2009	*	---	---	---	---	0	0	0	0	0	---	0
08/11/2009	*	---	---	---	---	0	0	0	1	10	0	---
08/12/2009	*	---	---	---	---	0	1	0	3	31	---	27
08/13/2009	*	---	---	---	---	0	0	0	3	30	---	---
08/14/2009	*	---	---	---	---	0	1	0	0	0	0	0
08/15/2009	*	---	---	---	---	0	0	0	0	0	---	---
08/16/2009	*	---	---	---	---	0	0	0	0	9	---	0
08/17/2009	*	---	---	---	---	0	0	0	0	0	---	---
08/18/2009	*	---	---	---	---	0	0	0	1	0	7	0
08/19/2009	*	---	---	---	---	0	0	0	1	0	---	0
08/20/2009	*	---	---	---	---	0	0	0	2	0	---	0
08/21/2009	*	---	---	---	---	---	---	---	---	---	---	---
<hr/>												
<b>Total:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>34</b>	<b>141</b>	<b>7</b>	<b>27</b>
<b># Days:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>4</b>	<b>8</b>
<b>Average:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>10</b>	<b>2</b>	<b>3</b>
<b>YTD</b>		<b>170</b>	<b>0</b>	<b>0</b>	<b>177</b>	<b>46,501</b>	<b>46,360</b>	<b>21,692</b>	<b>4,920</b>	<b>190,806</b>	<b>111,940</b>	<b>74,945</b>

\* See sampling comments <http://www.fpc.org/currentDaily/smpcomments.htm>

Smolt indices, clipped & unclipped or combined, are presented in the following order: yearling chinook (chinook 1's), subyearling chinook (chinook 0's), steelhead, coho, and sockeye. Two classes of fish counts are shown in these tables: collection counts, which account for sample rates but are not adjusted for flow; and passage indices, which are collection counts divided by the proportion of water passing through the sampled powerhouse. Passage indices are not population estimates, but are used to adjust collection counts for daily fluctuations in the site's or project's operations. The classes of counts presented in the report are defined below for each site. Most samples occur over a 24-hr period that spans two calendar days. In this report, the date shown corresponds with the sample end date.

### Definitions for Smolt Index Counts

- WTB (Collection) = Salmon River Trap at Whitebird : Collection Counts
- IMN (Collection) = Imnaha River Trap : Collection Counts
- GRN (Collection) = Grande Ronde River Trap : Collection Counts
- LEW (Collection) = Snake River Trap at Lewiston : Collection Counts
- LGR (Index) = Lower Granite Dam Bypass Collection System : Passage Index Counts  
     Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill)}
- LGS (Index) = Little Goose Bypass Collection System : Passage Index Counts  
     Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill)}
- LMN (Index) = Lower Monumental Dam Bypass Collection System : Passage Index Counts  
     Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill)}
- RIS (Index) = Rock Island Dam Second Powerhouse Bypass Trap : Passage Index Counts  
     Passage Index = Collection Counts / {Powerhouse 2 Flow / (Powerhouse 1 & 2 Flow + Spill)}
- MCN (Index) = McNary Dam Bypass Collection System : Passage Index Counts  
     Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill)}
- JDA (Index) = John Day Dam Bypass Collection System : Passage Index Counts  
     Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill)}
- BO2 (Index) = Bonneville Dam Second Powerhouse Bypass Collection System : Passage Index Counts  
     Passage Index = Collection Counts / {Powerhouse 2 Flow / (Powerhouse 1 & 2 Flow + Spill)}

JDA and BO2 data collected for the FPC by Pacific States Marine Fisheries Commission.  
 RIS data collected for the FPC by Chelan Co. PUD/Washington Dept. of Fish and Wildlife.  
 LGR, LMN, and MCN data collected for the FPC by Washington Dept. of Fish and Wildlife.  
 LGS and GRN data collected for the FPC by Oregon Dept. of Fish and Wildlife.  
 IMN data collected for the FPC by the Nez Perce Tribe.

## Two Week Transportation Summary

Source: Fish Passage Center

Updated:

8/21/09 11:11 AM

		08/07/09	TO	08/21/09			
		Species					
Site	Data	CH0	CH1	CO	ST	SO	Grand Total
<b>LGR</b>	Sum of NumberCollected	1,375			144	1	1,520
	Sum of NumberBarged	932			82	0	1,014
	Sum of NumberBypassed	0			0	0	0
	Sum of Numbertrucked	428			56	1	485
	Sum of SampleMorts	10			4	0	14
	Sum of FacilityMorts	5			2	0	7
	Sum of ResearchMorts	0			0	0	0
	Sum of TotalProjectMorts	15			6	0	21
<b>LGS</b>	Sum of NumberCollected	2,623			77	4	2,706
	Sum of NumberBarged	2,263			47	3	2,315
	Sum of NumberBypassed	0			0	0	0
	Sum of Numbertrucked	304			25	0	329
	Sum of SampleMorts	36			5	1	42
	Sum of FacilityMorts	21			0	0	21
	Sum of ResearchMorts	0			0	0	0
	Sum of TotalProjectMorts	57			5	1	63
<b>LMN</b>	Sum of NumberCollected	376		3	30	1	410
	Sum of NumberBarged	261		3	24	0	288
	Sum of NumberBypassed	3		0	0	0	3
	Sum of Numbertrucked	98		0	5	1	104
	Sum of SampleMorts	7		0	1	0	8
	Sum of FacilityMorts	7		0	0	0	7
	Sum of ResearchMorts	0		0	0	0	0
	Sum of TotalProjectMorts	14		0	1	0	15
<b>MCN</b>	Sum of NumberCollected	32,870			10	70	32,950
	Sum of NumberBarged	22,128			10	65	22,203
	Sum of NumberBypassed	0			0	0	0
	Sum of Numbertrucked	10,462			0	5	10,467
	Sum of SampleMorts	50			0	0	50
	Sum of FacilityMorts	230			0	0	230
	Sum of ResearchMorts	0			0	0	0
	Sum of TotalProjectMorts	280			0	0	280
Total Sum of NumberCollected		37,244		3	261	6	37,586
Total Sum of NumberBarged		25,584		3	163	3	25,820
Total Sum of NumberBypassed		3		0	0	0	3
Total Sum of Numbertrucked		11,292		0	86	2	11,385
Total Sum of SampleMorts		103		0	10	1	114
Total Sum of FacilityMorts		263		0	2	0	265
Total Sum of ResearchMorts		0		0	0	0	0
Total Sum of TotalProjectMorts		366		0	12	1	379



### YTD Transportation Summary

Source: Fish Passage Center

Updated:

8/21/09 11:12 AM

TO: 08/21/09

		Species					
Site	Data	CH0	CH1	CO	SO	ST	Grand Total
<b>LGR</b>	Sum of NumberCollected	700,896	2,352,637	65,753	33,451	3,430,195	6,582,932
	Sum of NumberBarged	680,280	1,500,926	63,607	26,169	1,841,961	4,112,943
	Sum of NumberBypassed	15,858	847,954	1,951	7,068	1,587,772	2,460,603
	Sum of NumberTrucked	428	0	56	0	1	485
	Sum of SampleMorts	254	118	8	22	33	435
	Sum of FacilityMorts	4,057	2,734	131	192	409	7,523
	Sum of ResearchMorts	19	1,035	0	0	19	1,073
	Sum of TotalProjectMorts	4,330	3,887	139	214	461	9,031
<b>LGS</b>	Sum of NumberCollected	849,823	1,720,161	59,252	33,650	2,517,669	5,180,555
	Sum of NumberBarged	833,736	966,563	56,372	27,768	1,057,254	2,941,693
	Sum of NumberBypassed	9,300	751,923	2,825	5,826	1,460,071	2,229,945
	Sum of NumberTrucked	304	0	25	0	0	329
	Sum of SampleMorts	420	49	27	9	21	526
	Sum of FacilityMorts	6,052	1,622	3	47	323	8,047
	Sum of ResearchMorts	12	4	0	0	0	16
	Sum of TotalProjectMorts	6,484	1,675	30	56	344	8,589
<b>LMN</b>	Sum of NumberCollected	325,134	321,111	13,975	16,048	518,661	1,194,929
	Sum of NumberBarged	318,442	312,082	13,950	15,870	506,287	1,166,631
	Sum of NumberBypassed	5,817	8,790	9	114	12,089	26,819
	Sum of NumberTrucked	98	0	5	0	1	104
	Sum of SampleMorts	92	15	2	3	9	121
	Sum of FacilityMorts	583	237	8	7	258	1,093
	Sum of ResearchMorts	0	0	0	0	0	0
	Sum of TotalProjectMorts	675	252	10	10	267	1,214
<b>MCN</b>	Sum of NumberCollected	1,814,329	1,303,737	69,871	106,345	467,736	3,762,018
	Sum of NumberBarged	414,822	196	448	425	74	415,965
	Sum of NumberBypassed	1,353,698	1,301,926	69,356	105,852	467,487	3,298,319
	Sum of NumberTrucked	10,462	0	0	5	0	10,467
	Sum of SampleMorts	776	149	1	2	14	942
	Sum of FacilityMorts	34,052	1,441	65	59	157	35,774
	Sum of ResearchMorts	518	25	0	1	3	547
	Sum of TotalProjectMorts	35,346	1,615	66	62	174	37,263
Total Sum of NumberCollected		3,690,182	5,697,646	208,851	189,494	6,934,261	16,720,434
Total Sum of NumberBarged		2,247,280	2,779,767	134,377	70,232	3,405,576	8,637,232
Total Sum of NumberBypassed		1,384,673	2,910,593	74,141	118,860	3,527,419	8,015,686
Total Sum of NumberTrucked		11,292	0	86	5	2	11,385
Total Sum of SampleMorts		1,542	331	38	36	77	2,024
Total Sum of FacilityMorts		44,744	6,034	207	305	1,147	52,437
Total Sum of ResearchMorts		549	1,064	0	1	22	1,636
Total Sum of TotalProjectMorts		46,835	7,429	245	342	1,246	56,097

**Cumulative Adult Passage at Mainstem Dams Through: 08/20**

DAM	EndDate	Spring Chinook						Summer Chinook						Fall Chinook					
		2009		2008		10-Yr Avg.		2009		2008		10-Yr Avg.		2009		2008		10-Yr Avg.	
		Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack
BON	08/20	114525	66631	125543	17554	160243	11507	81936	37416	78271	11621	76947	10024	25283	6414	12887	2872	14094	1981
TDA	08/20	93908	53646	95438	15801	113852	9048	79916	27878	65073	12206	66821	7950	14883	2989	6729	2181	7488	1389
JDA	08/20	76806	49733	81772	14925	95147	7579	65989	33147	63649	13680	61980	8146	4514	1829	4182	2131	4276	1177
MCN	08/19	70413	43328	68080	12133	86998	7409	57137	21182	54735	11239	59015	7256	2720	822	2121	374	2517	520
IHR	08/19	55435	28223	53142	7757	59050	4663	23856	9400	23693	4964	13243	2568	536	158	548	51	216	25
LMN	08/20	66931	20009	54512	6885	57079	4270	23353	11733	27343	2890	13719	1912	329	166	362	94	168	43
LGS	08/20	52642	24331	50396	7805	54016	4453	20340	11207	21748	4811	11241	2521	237	58	230	32	104	17
LGR	08/20	49667	31064	50146	10946	54673	5280	14482	16367	22612	5072	11171	2757	65	70	105	22	38	11
PRD	08/18	13469	2910	12178	620	18164	621	49417	2117	39174	3442	53065	2394	1017	110	836	1794	1153	319
RIS	08/18	12634	6003	12490	1119	14914	1069	44295	7727	38171	3096	50031	5515	168	53	126	62	173	51
RRH	08/18	6090	1086	4065	371	5734	430	34778	5193	29557	2100	37492	3852	0	0	0	0	0	0
WEL	08/19	6307	1867	2708	426	4250	321	24657	3469	19864	1075	26174	1690	0	0	0	0	0	0
WFA	08/19	25067	2670	14151	521	-	-	-	-	-	-	-	-	88	40	1	21	-	-

DAM	Coho						Sockeye			Steelhead			
	2009		2008		10-Yr Avg.		2009	2008	10-Yr Avg.	2009	2008	10-Yr Avg.	Wild 2009
	Adult	Jack	Adult	Jack	Adult	Jack							
BON	3831	906	171	30	423	79	177808	213586	78589	376758	208259	207532	121884
TDA	430	199	4	2	28	4	155557	177982	66379	130779	102423	80639	47150
JDA	34	45	40	13	15	0	157366	193367	72401	106230	80130	56417	39435
MCN	19	16	0	0	0	0	121660	146920	58758	40697	51698	40082	15138
IHR	0	0	0	0	0	0	867	539	90	24959	33672	20116	7142
LMN	0	0	0	0	0	0	1161	722	103	25572	33924	18233	9119
LGS	0	0	0	0	0	0	1065	593	96	16780	20010	11438	6005
LGR	0	0	0	0	0	0	1214	886	126	20241	20748	14389	6817
PRD	18	1	4	-1	6	0	153436	196832	74855	6118	7948	5420	0
RIS	0	3	0	0	1	0	162782	193714	70919	4781	6976	4363	2241
RRH	0	0	0	0	1	0	132994	161291	52341	3821	5212	3032	1744
WEL	0	0	0	0	0	0	134755	165270	52749	2121	2514	1675	943
WFA	4	2	33	38	-	-	-	-	-	17126	18646	-	-

PRD does not post wild steelhead numbers. These numbers were collected from USACE, Grant PUD, Douglas PUD, Chelan PUD, ODFW and DART. Wild steelhead numbers are included in the total. Wild Steelhead are defined as unclipped fish. Historic counts (pre-1996) were obtained from CRITFC and compiled by the FPC. Historic counts 1997 to present were obtained from the Corps of Engineers.

Page last updated on: 08/21/09

BON counts from January 1, 2009 to March 14, 2009 (historical counts begin March 15):

Year	Chinook Adult	Chinook Jack	Steelhead	Wild Steelhead
2009	19	-1	321	109
2008	42	0	561	270