



# Fish Passage Center

## Weekly Report #16–19

July 22, 2016

### Summary of Events

#### Water Supply

Precipitation throughout the Columbia Basin has varied between 40% and 176% of average at individual sub-basins over July. Precipitation above The Dalles has been 108% of average over July. Over the 2016 water year, precipitation has ranged between 85% and 106% of average.

**Table 1.** Summary of July precipitation and cumulative October through July 20<sup>th</sup> precipitation with respect to average (1981–2010), at select locations within the Columbia and Snake River Basins.

Location	Water Year 2016		Water Year 2016	
	July 1–20, 2016		October 1, 2015 to July 20, 2016	
	Observed (inches)	% Average	Observed (inches)	% Average
Columbia above Coulee	1.59	117	33.2	100
Snow River above Ice Harbor	0.51	92	19.2	93
Columbia above The Dalles	0.87	108	24.5	98
Kootenai	1.35	93	32.7	99
Clark Fork	1.56	164	21.7	89
Flathead	1.65	135	34.2	106
Pend Oreille River Basin above Waneta Dam	1.48	141	28.8	98
Salmon River Basin	0.60	76	24.2	92
Upper Snake Tributaries	0.34	40	20.1	85
Clearwater	1.59	164	37.2	99
Willamette River above Portland	0.94	176	66.8	106

Table 2 displays the July 20<sup>th</sup> ESP runoff volume forecasts for multiple reservoirs along with the June COE forecasts at Libby and Dworshak. The July 20<sup>th</sup> ESP forecast at The Dalles between April and August is 78,963 Kaf (90% of average).

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

Location	July 20, 2016 5-day QPF ESP	
	% Average (1981–2010)	Runoff Volume (Kaf)
The Dalles (Apr–Aug)	90	78,963
Grand Coulee (Apr–Aug)	92	52,044
Libby Res. Inflow, MT (Apr–Aug)	91 110*	5,328 6,445*
Hungry Horse Res. Inflow, MT (Apr–Aug)	87	1,690
Lower Granite Res. Inflow (Apr–July)	83	16,493
Brownlee Res. Inflow (Apr–July)	87	1,635
Dworshak Res. Inflow (Apr–July)	86 86*	2,071 2,083*

\* Denotes COE June Forecast

Grand Coulee Reservoir is at 1,287.5 feet (7-20-16) and has held steady over the last week. Outflows at Grand Coulee have ranged between 103.6 and 118.9 Kcfs over the last week.

The Libby Reservoir is currently at elevation 2,445.4 feet (7-20-16) and has refilled 1.5 feet over the previous week. Daily average outflows at Libby Dam have been 7.0 Kcfs over the last week.

Hungry Horse is currently at an elevation of 3,558.5 feet (7-20-16) and has drafted 0.3 feet over the last week. Outflows at Hungry Horse have been 2.0-3.1 Kcfs over the last week.

Dworshak is currently at an elevation of 1,582.5 feet (7-20-16) and has drafted 5.0 feet over the last week. Dworshak has increased outflows over the last week from 7.5 Kcfs to 9.7 Kcfs.

The Brownlee Reservoir was at an elevation of 2,065.8 feet on July 20<sup>th</sup>, 2016, and has drafted 3.1 ft. over the last week. Outflows at Hells Canyon have ranged between 8.0 and 17.3 Kcfs over the last week.

The Summer Biological Opinion flow period began on June 21<sup>st</sup> with a flow objective of 50.4 Kcfs at Lower Granite. Over the Summer Flow Period, flows at Lower Granite Dam have averaged 37.3 Kcfs and 34.1 Kcfs over the last week.

The Summer Biological Opinion Flow Objectives will be 200 Kcfs at McNary Dam (began July 1<sup>st</sup>). Over the Summer Flow Period, flows at McNary have averaged 166.0 Kcfs and 162.4 Kcfs last week.

**Spill and River Temperature**

No spill occurred at Dworshak Dam over the past week.

Summer spill for juvenile fish passage began on June 21<sup>st</sup> and will continue through August 31<sup>st</sup>. Summer spill for fish passage at the Snake River projects is to occur at the following amounts described in the 2016 Fish Operations Plan (FOP).

Project	Spill Level Day/Night
Lower Granite	18 Kcfs/18 Kcfs
Little Goose	30%/30%
Lower Monumental	17 Kcfs/17 Kcfs
Ice Harbor	June 21-July 13: 30%/30% vs. 45 Kcfs/Gas Cap July 13-August 31: 45 Kcfs/Gas Cap

At Lower Granite Dam the removable spillway weir was closed on June 29<sup>th</sup> to reduce the amount of surface warm water transferred from the forebay to the tailrace. The spill pattern was changed from a “bulk” spill pattern to a “uniform” spill pattern. Since that time daily average spill has been less than 18 Kcfs, ranging from 17.6 to 17.9 Kcfs. At Little Goose Dam spill was changed on July 6<sup>th</sup> from spilling 30% of instantaneous flow, to a fixed volume spill operation to maintain compatibility with Lower Granite and Lower Monumental operations. Presently, at all daily flows less than 32 Kcfs, spill will occur at a fixed volume, but above 32 Kcfs the 30% of instantaneous flow will be

implemented. Both conditions occurred over the past week. At the other Lower Snake River projects (Lower Monumental and Ice Harbor dams) spill has occurred at the 2016 FOP levels. At low flows, which have occurred at some Snake River projects this week, BIOP spill levels are considered met if all flow in excess of that needed for the operation of one turbine unit at a project is provided as spill.

Summer spill for fish passage began on June 16<sup>th</sup> at the middle Columbia River projects. Spill for fish passage at the middle Columbia River projects is to occur at the following amounts described in the 2016 FOP.

Project	Spill Level Day/Night
McNary	June 16-Aug 31: 50%/50%
John Day	June 16-July 20: 30%/30% and 40%/40% July 20-August 31: 30%/30%
The Dalles	40%/40%
Bonneville	95 Kcfs/95 Kcfs

This past week all Middle Columbia River projects (McNary, John Day and The Dalles dams) have spilled at the 2016 FOP levels. Spill at Bonneville Dam has been changed to 95 Kcfs to address erosion concerns below the project.

All sites were within TDG criteria over the past week.

**Note:** The State of Oregon TDG waiver requires compliance only with 120% TDG in the tailrace, while the State of Washington requires compliance with both a 115% TDG forebay requirement and a 120% tailrace TDG requirement. The State of Oregon and the State of Washington also use different methodologies to estimate the 12-hour average TDG. For Oregon, the 12-hour average is based on the 12 highest hourly TDG measurements in a single calendar day (not necessarily consecutive). For Washington, the 12-hour average is based on 12-hour rolling averages. The highest of the rolling averages is what is reported as the 12-hour average for a given day. The location of a TDG monitor will dictate which of these methodologies is used for compliance monitoring. The Washington methodology will apply to all the lower Snake River projects, as well as the middle Columbia River forebay monitors. On any

given day the compliance of the tailrace monitors at the middle Columbia River projects will be determined using either the Washington or Oregon methodology, whichever is the most restrictive, and spill will be decreased if needed.

Low fish numbers precluded sampling for GBT at Little Goose Dam this week. Monitoring for signs of gas bubble trauma (GBT) occurred at Lower Monumental, McNary, Bonneville, and Rock Island dams over the past week. No fish were observed with signs of GBT over the past week.

**Temperature:** At present, water temperatures are above the 68° F temperature standard at the forebays of Bonneville and Ice Harbor dams and approaching the standard at McNary Dam. The forebay temperatures at Lower Granite Dam have increased this week. The daily average temperature in the Lower Granite forebay was 63.0° F on July 15<sup>th</sup>, whereas that for July 21<sup>st</sup> was 65.4° F. It is warmer (69.9° F) downstream at the forebay of Ice Harbor Dam, where the temperature is about one degree warmer than last week. At McNary and Bonneville dams the forebay temperatures were 67.7°F and 68.9°F, respectively on July 21<sup>st</sup>. These forebay temperatures are measuring 3 to 4 degrees Fahrenheit less than the levels measured at this time last year.

### Smolt Monitoring

Smolt Monitoring Program (SMP) sampling was ongoing at all SMP bypass facilities and the Imnaha trap this week. However, sampling at the Imnaha Trap was terminated after the sample on July 21<sup>st</sup>. Subyearling Chinook dominated this week's samples at all of the SMP bypass facilities. However, when compared to the previous week, subyearling Chinook passage decreased at nearly SMP bypass facilities except Bonneville and Rock Island dams. Finally, passage of spring migrants (i.e., yearling Chinook, steelhead, coho, and sockeye) was extremely low at all SMP bypass facilities.

Samples at Bonneville Dam (BON) were again dominated by subyearling Chinook. This week's daily average passage index for subyearling Chinook at BON was nearly 35,000 per day, which is an increase from last week's daily average passage index of about 21,500 per day. This increase in passage is likely due to large releases of hatchery subyearling fall Chinook into the Little White Salmon River that occurred on July 11<sup>th</sup>.

No spring migrants were encountered in this week's samples at BON. Furthermore, no lamprey juveniles were encountered at BON this week.

Sampling at John Day Dam (JDA) in 2016 is every-other-day for the entire SMP season. This is the first time every-other-day sampling has occurred at this site over the entire season. Subyearling Chinook continued to dominate the collections at JDA this week. This week's daily average passage index was about 4,500 fish per day, which is a decrease from last week's daily average passage index of about 8,200 subyearling Chinook per day. Very few spring migrants were encountered in this week's samples at JDA. In fact, the only species of spring migrant encountered this week was sockeye, which were observed in the sample from July 15<sup>th</sup>. Finally, Pacific lamprey macrophthalmia were encountered in three of this week's four samples. No Pacific lamprey ammocoetes were encountered at JDA this week.

As in recent years, sampling at McNary Dam (MCN) in 2016 will be every-other-day for the entire SMP season. Subyearling Chinook dominated the collections at MCN this week, with a daily average passage index of about 7,500 per day. This is a decrease over last week's daily average passage index of about 28,400 subyearling Chinook per day. No spring migrants and no lamprey juveniles were encountered in this week's samples at MCN.

This week's samples at Lower Granite Dam (LGR) were again dominated by subyearling Chinook, with a daily average passage index of about 950 per day. This is a decrease over last week's daily average passage index of about 7,100 subyearling Chinook per day. Passage of spring migrants was extremely low this week. In fact, the only spring migrants that were encountered in this week's samples were yearling Chinook and steelhead. Finally, Pacific lamprey ammocoetes were encountered in four of this week's samples. No Pacific lamprey macrophthalmia were encountered in this week's samples at LGR.

Sampling at Little Goose Dam (LGS) was limited to a 24-hour sample every-other-day until transportation began, at which time sampling switched to daily. Subyearling Chinook dominated this week's collections at LGS. This week's daily average passage index for subyearling Chinook at LGS was about 1,750 per day, which is a decrease over last week's daily average

passage index of about 3,900 subyearlings per day. The only spring migrants that were encountered in this week's samples at LGS were steelhead. Finally, Pacific lamprey ammocoetes were encountered in two of this week's samples (July 15<sup>th</sup> and July 17<sup>th</sup>) while Pacific lamprey macrophthalmia were encountered in five of this week's samples. Macrophthalmia collections over these five days ranged from 4 to 25 fish per day.

Sampling at Lower Monumental Dam (LMN) was limited to a 24-hour sample every-third-day through the April 14<sup>th</sup>, every-other-day from April 16<sup>th</sup> to April 30<sup>th</sup>, and every day with the initiation of transportation. This week's samples at LMN were dominated by subyearling Chinook, with a daily average passage index of only about 250 per day. This is a large decrease over last week's daily average passage index of about 2,250 subyearlings per day. The only spring migrants that were encountered in this week's samples were yearling Chinook, which were encountered in three of this week's samples. Finally, Pacific lamprey macrophthalmia were encountered in one of this week's samples (July 18<sup>th</sup>) at LMN.

Subyearling Chinook continued to dominate the samples at Rock Island Dam (RIS) this week. This week's daily average passage index for subyearling Chinook at RIS was about 150 per day, which is similar to last week. Passage of spring migrants was very low this week. One Pacific lamprey ammocoete and one unidentified lamprey ammocoete were encountered this week's samples at RIS. Furthermore, Pacific lamprey macrophthalmia were encountered in three of this week's samples.

The Imnaha River Trap (IMN) is located at river kilometer seven and is operated by the Nez Perce Tribe. Sampling at the Imnaha River Trap is year-round and, for 2016, the Fish Passage Center has been receiving data since the January 1, 2016 sample. However, due to the remote nature of the trap, the Nez Perce Tribe is able to send collection data to the FPC only periodically. Currently, the FPC has data from IMN through the July 21 sample. Starting in July, sampling at IMN switched from seven days per week to only five days per week, with weekends off. For the period of July 11-July 21, yearling Chinook dominated the collections at IMN. The daily average collection for yearling Chinook was less than 10 per day. Very few steelhead juveniles were collected during this same period. Sampling at the

Imnaha Trap was terminated after the sample on July 21<sup>st</sup>.

## 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. No new releases were scheduled for this zone this week. Furthermore, no releases are scheduled for this zone 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. No new releases were scheduled for this zone this week and no new releases are scheduled 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 new releases were scheduled for this zone this week and no new releases are scheduled over the next two weeks.

## Adult Passage

Daily passage numbers at Bonneville Dam ranged between 94 and 173 adult summer Chinook in the last week. The 2016 summer Chinook count of 109,607 is about 74.5% of the 2015 count, while being 1.2 times greater than the 10-year average. The 2016 summer Chinook jack count of 9,730 is about 60.4% of the 2015 count and 49% of the 10-year average count. At Willamette Falls, 28,403 adult spring Chinook have been counted so far this year. In 2015, 50,005 adult spring Chinook were counted at Willamette Falls. This year's count is about 56.8% of the 2015 count and 82.5% of the 10-year average count of 34,424. As of July 21st, a total of 74,187 adult summer Chinook have been counted at McNary Dam and 9,928 have been counted at Lower Granite Dam. The 2016 McNary Dam adult summer Chinook count has 7,134 fewer fish than the 2015 count, while being about 1.2 times greater than the 10-year average count. The 2016 Lower Granite Dam adult summer Chinook count has 2,200 fewer fish than the 2015 count and 5,281 fewer fish than the 10-year average count.

The 2016 Bonneville Dam adult steelhead count

of 38,811 is 1.2 times greater than the 2015 count of 31,691, while being 69.4% of the 10-year average count of 55,947. The 2016 Bonneville Dam adult wild steelhead count of 15,848 has 1,794 fewer fish than the 2015 count of 17,642 and 9,830 fewer fish than the 10-year average count of 25,678. Daily adult steelhead counts at Lower Granite Dam ranged from 71 to 139 adults per day last week. This year's Lower Granite steelhead count of 6,978 is about 72.6% of the 2015 count of 9,613 and 61.2% of the 10-year average count of 11,048. The 2016 Lower Granite Dam adult wild steelhead count of 3,988 is 86.9% of the 2015 count of 4,589 and is about 95.8% of the 10-year average count of 4,165. At Willamette Falls, the 2016 count for steelhead was 24,660 as of July 17th. This year's steelhead count is about 3.6 times greater than the 2015 count of 6,831 and about 1.2 times greater than the 10-year average count of 21,073.

Daily adult sockeye passage numbers at Bonneville Dam ranged between 387 and 896 last week. The 2016 adult sockeye count at Bonneville Dam of 338,035 is about 67.6% of the 2015 count and 1.2 times greater than the 10-year average count. The 2016 adult sockeye count at McNary Dam of 258,339 is about 96.3% of the 2015 count, while being about 1.3 times greater than the 10-year average count. The Lower Granite Dam 2016 adult sockeye count of 740 has 419 more fish than the 2015 count of 321 and 57 fewer fish than the 10-year average count. As of July 20th at Bonneville Dam, the adult shad count was 1,755,731. This year's shad count is about 97% of the 2015 count of 1,809,825 and 77.8% of the 10-year average count of 2,256,748.

## Hatchery Releases Last Two Weeks

### Hatchery Release Summary

**From:** 7/9/2016 to 07/22/16

Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver
U.S. Fish and Wildlife Service	Little White Salmon NFH	CH0	FA	2016	3,960,000	07-11-16	07-11-16	Little White Salmon Hatchery	Little White Salmon River
U.S. Fish and Wildlife Service	Willard Hatchery	CH0	FA	2016	2,000,000	07-11-16	07-11-16	Willard Hatchery	Little White Salmon River
<b>U.S. Fish and Wildlife Service Total</b>					<b>5,960,000</b>				
<b>Grand Total</b>					<b>5,960,000</b>				

## Hatchery Releases Next Two Weeks

From: Hatchery Release Summary  
7/23/2016 to 8/5/2016

Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver
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No Releases Scheduled

CH = Chinook, ST = Steelhead, CO = Coho, SO = Sockeye, CT = Cutthroat Trout, CM = Chum

**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
07/08/2016	107.7	0.1	107.3	0.0	122.4	9.0	122.7	10.6	130.4	23.9	147.9	18.9	144.9	26.9
07/09/2016	95.4	0.1	96.8	0.0	100.0	6.8	97.7	9.2	102.6	21.7	105.4	18.3	103.0	25.6
07/10/2016	87.2	0.1	85.1	0.0	88.2	6.7	83.8	8.6	87.7	19.3	84.4	18.8	83.8	26.1
07/11/2016	109.3	0.1	107.8	0.0	107.1	10.3	106.7	10.5	112.4	24.0	116.6	19.8	110.7	28.7
07/12/2016	95.9	0.1	90.9	0.0	103.5	7.1	101.9	9.9	108.9	22.0	111.1	19.9	109.4	25.0
07/13/2016	107.4	0.1	110.6	0.0	110.6	9.8	106.4	9.5	112.1	22.4	116.5	19.6	114.8	25.0
07/14/2016	110.0	0.1	108.1	0.0	112.6	8.7	110.7	8.8	118.8	21.6	118.4	20.2	112.0	25.8
07/15/2016	118.9	0.1	117.4	0.0	122.5	10.2	119.8	28.1	120.7	23.0	125.2	37.1	120.3	26.1
07/16/2016	106.9	0.1	109.1	0.0	113.1	9.0	116.3	15.7	121.1	23.0	128.2	23.0	127.3	29.8
07/17/2016	112.0	0.1	107.9	0.0	111.6	8.4	108.3	9.7	112.5	20.1	118.4	20.4	115.5	29.7
07/18/2016	104.3	0.1	106.2	0.0	113.6	9.4	120.2	9.4	125.6	22.1	132.1	19.9	130.6	29.0
07/19/2016	103.6	0.1	105.9	0.0	108.3	8.6	108.4	9.8	111.2	22.4	114.9	19.6	113.3	27.0
07/20/2016	109.3	0.1	104.4	0.0	112.1	8.7	109.8	9.1	113.5	22.7	124.3	19.9	122.2	27.5
07/21/2016	102.0	0.1	110.1	0.0	116.2	9.0	114.0	21.7	115.2	22.1	123.7	19.4	118.3	28.3

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

Date	Dworshak		Brownlee Inflow	Hells Canyon Outflow	Lower Granite		Little Goose		Lower Monumental		Ice Harbor	
	Flow	Spill			Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
07/08/2016	7.4	0.0	---	11.2	32.1	17.6	28.2	8.5	28.1	13.6	27.8	8.9
07/09/2016	7.4	0.0	---	10.1	32.4	17.7	30.7	10.8	29.8	17.0	31.8	18.5
07/10/2016	7.4	0.0	---	9.4	31.0	17.6	28.4	10.8	28.2	16.2	29.4	18.4
07/11/2016	7.4	0.0	---	9.5	33.4	17.8	31.6	10.7	31.2	16.6	31.7	12.8
07/12/2016	7.5	0.0	---	10.2	37.7	17.6	35.7	10.7	34.7	16.2	34.6	10.3
07/13/2016	7.4	0.0	---	11.8	35.8	17.6	35.3	10.6	34.7	17.0	36.3	22.9
07/14/2016	7.5	0.0	---	14.0	35.3	17.8	33.6	10.0	33.6	16.9	35.2	24.6
07/15/2016	7.5	0.0	---	12.4	37.3	17.7	33.8	10.0	34.0	17.0	36.6	26.2
07/16/2016	7.5	0.0	---	10.8	33.6	17.7	33.5	10.1	31.6	16.5	31.8	21.1
07/17/2016	7.5	0.0	---	10.7	30.6	17.7	27.5	8.2	25.7	13.4	27.1	16.2
07/18/2016	9.6	0.0	---	13.5	31.4	17.6	30.6	8.8	30.7	16.7	33.0	22.1
07/19/2016	9.6	0.0	---	13.1	35.2	17.7	31.9	10.6	32.8	16.9	34.5	23.4
07/20/2016	9.7	0.0	---	12.7	34.9	17.8	32.0	10.6	31.5	16.5	31.4	20.1
07/21/2016	9.7	0.0	---	12.8	33.0	17.9	31.7	10.6	30.8	17.0	32.2	21.2

**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
07/08/2016	183.3	91.9	177.0	68.3	162.3	65.1	168.0	95.3	0.9	59.4
07/09/2016	169.5	85.0	164.8	49.4	149.2	59.7	165.6	93.8	7.0	52.4
07/10/2016	136.4	68.4	125.4	39.6	113.6	45.2	139.3	93.9	1.2	31.8
07/11/2016	139.0	69.7	133.0	53.4	119.9	47.7	139.1	94.3	0.9	31.5
07/12/2016	150.4	75.3	142.2	54.2	127.8	50.9	144.5	94.0	0.9	37.2
07/13/2016	159.4	79.9	153.1	45.9	141.2	56.4	151.6	94.0	0.9	44.2
07/14/2016	160.3	80.3	161.1	50.7	149.3	59.6	157.0	94.3	1.6	48.7
07/15/2016	164.1	82.3	155.8	62.6	141.1	56.5	153.7	95.3	0.0	46.0
07/16/2016	167.5	83.9	157.9	60.6	143.5	57.7	158.7	95.0	0.0	51.2
07/17/2016	151.7	76.1	153.1	45.8	141.0	56.7	159.1	94.9	0.0	51.8
07/18/2016	172.0	86.1	160.1	50.8	145.8	58.4	159.0	94.9	8.0	43.8
07/19/2016	170.2	85.4	165.5	66.3	150.8	60.3	165.9	94.8	5.2	53.6
07/20/2016	151.3	75.9	146.0	55.6	129.8	52.2	145.3	94.6	0.0	38.4
07/21/2016	168.5	84.3	162.9	48.7	143.2	57.3	159.9	94.5	0.0	52.9



## 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>Lower Granite Dam</b>										
<b>Little Goose Dam</b>										
	07/11/16 Chinook + Steelhead	83*	0	0			0	0	0	0
	07/18/16 Chinook + Steelhead	15*	0	0			0	0	0	0
<b>Lower Monumental Dam</b>										
	07/13/16 Chinook + Steelhead	60*	0	0			0	0	0	0
<b>McNary Dam</b>										
	07/11/16 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	07/15/16 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	07/17/16 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	07/21/16 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
<b>Bonneville Dam</b>										
	07/09/16 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	07/12/16 Chinook + Steelhead	100	1	1	1.00%	0.00%	1	0	0	0
	07/16/16 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	07/19/16 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
<b>Rock Island Dam</b>										
	07/19/16 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0

\* Sample size criteria not met, therefore no % fish with GBT estimated for this sample day.

## 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>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>					
	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>				
7/8	111.0	116.7	118.0	23	---	---	---	0	105.4	105.6	105.7	24	104.5	104.8	105.6	24	105.4	105.7	105.8	24
7/9	104.5	104.7	105.3	24	---	---	---	0	105.8	106.4	108.0	24	104.6	104.8	105.6	24	104.8	105.0	105.3	24
7/10	104.9	105.6	106.2	22	---	---	---	0	105.5	105.8	106.5	24	104.3	104.6	105.0	24	104.8	105.0	105.3	22
7/11	104.8	104.8	105.0	7	---	---	---	0	105.4	105.8	108.7	24	104.2	104.7	109.3	24	104.8	104.9	105.1	19
7/12	104.8	105.1	105.4	24	---	---	---	0	105.4	105.8	106.6	24	103.5	104.0	105.0	24	104.6	104.9	105.1	24
7/13	104.2	104.5	104.7	24	---	---	---	0	104.4	104.6	105.2	24	102.9	103.3	104.2	24	104.2	104.4	104.9	24
7/14	104.2	104.8	105.0	24	---	---	---	0	104.6	105.0	105.4	24	103.2	103.6	104.0	24	103.8	104.2	104.6	24
7/15	104.9	105.3	105.8	24	---	---	---	0	105.0	105.3	105.8	24	103.5	103.7	103.9	24	104.0	104.4	104.9	24
7/16	104.6	104.8	105.0	24	---	---	---	0	105.0	105.1	105.2	14	103.6	103.7	104.1	19	103.9	104.3	104.6	23
7/17	104.3	104.7	104.8	24	---	---	---	0	104.8	105.0	105.2	24	103.6	103.9	104.2	24	103.9	104.3	104.5	24
7/18	104.4	104.7	105.2	24	---	---	---	0	104.4	104.7	105.0	24	103.3	103.5	103.8	24	103.8	103.9	104.2	24
7/19	104.0	104.5	104.9	24	---	---	---	0	104.4	104.6	105.0	24	102.8	103.3	103.8	24	103.6	103.9	104.1	24
7/20	104.0	104.4	104.8	23	---	---	---	0	104.2	104.3	104.4	24	102.7	103.2	103.4	24	103.5	103.8	104.1	24
7/21	104.0	104.2	105.0	16	---	---	---	0	104.3	104.6	104.8	23	103.0	103.6	104.3	23	103.6	104.1	104.8	23

### 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>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>					
	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>				
7/8	105.3	105.5	106.2	22	105.6	105.9	106.7	19	107.2	107.5	108.3	19	107.9	108.2	108.4	24	113.3	113.7	114.0	24
7/9	104.7	105.0	105.3	24	105.1	105.3	105.7	19	106.7	107.0	107.3	19	107.6	107.9	108.4	24	112.0	112.8	113.5	24
7/10	104.6	105.1	105.7	24	105.3	105.5	106.5	15	106.6	106.8	107.6	15	107.0	107.2	107.5	24	110.9	111.6	112.0	24
7/11	104.6	104.9	105.9	22	104.7	104.8	105.7	14	106.9	107.1	112.6	14	106.3	106.4	107.0	24	111.9	112.9	113.4	24
7/12	105.0	105.4	106.2	24	104.7	104.8	106.5	13	106.3	106.4	108.7	13	106.4	106.5	106.6	24	111.8	112.7	113.7	24
7/13	104.3	104.6	104.9	24	104.2	104.2	105.4	11	105.8	105.8	110.8	11	106.4	107.0	107.8	24	111.5	112.9	113.3	24
7/14	104.2	104.6	105.2	24	104.7	104.7	105.8	11	106.2	106.2	107.6	11	106.6	106.8	107.1	24	111.7	112.5	113.1	24
7/15	104.0	104.3	104.7	24	104.2	104.2	105.0	11	106.2	106.2	109.8	11	106.6	106.9	107.2	24	114.9	118.7	127.5	24
7/16	104.1	104.4	104.9	24	104.1	104.1	104.9	13	105.9	106.0	107.1	13	106.3	106.4	106.8	24	114.5	116.2	123.9	24
7/17	104.2	104.5	104.8	24	104.1	104.1	105.0	14	105.9	106.2	107.3	14	106.5	106.7	106.8	24	111.8	112.6	114.5	24
7/18	104.0	104.4	104.9	24	103.6	103.7	103.9	13	105.7	105.8	106.2	13	106.1	106.3	106.5	24	111.9	112.7	113.6	24
7/19	103.6	103.9	104.3	24	103.2	103.7	104.2	22	105.1	105.6	106.0	22	105.7	105.9	106.1	24	111.4	112.3	112.8	24
7/20	103.5	103.7	103.8	24	103.6	104.2	104.6	24	105.0	105.7	106.1	24	105.7	105.9	106.2	24	111.1	112.2	112.4	24
7/21	103.6	103.8	104.5	23	104.2	104.9	105.7	23	105.3	106.1	107.2	23	105.9	106.2	106.5	23	114.0	116.5	118.9	23

### 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>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>					
	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>				
7/8	108.7	109.1	109.4	24	113.8	115.0	116.2	24	110.7	111.5	111.8	24	111.8	112.0	112.2	24	110.1	110.3	110.4	24
7/9	108.5	108.8	109.0	24	113.7	114.6	115.2	24	110.4	110.7	111.0	24	112.1	112.5	113.2	24	109.8	109.9	110.1	24
7/10	107.4	107.8	108.7	24	112.9	113.9	115.6	24	109.0	109.5	110.1	24	112.3	112.7	113.3	24	109.4	109.7	109.8	24
7/11	107.3	107.8	108.6	24	113.2	114.2	114.9	24	107.9	108.7	109.4	24	111.3	111.9	113.2	24	107.9	108.6	109.3	24
7/12	107.3	107.8	108.6	24	112.4	114.0	114.8	24	108.6	109.0	109.3	24	111.5	111.9	112.5	24	109.0	109.2	109.4	24
7/13	107.1	107.6	108.2	24	112.8	113.5	114.4	24	107.9	108.6	109.0	24	110.8	110.9	111.3	18	108.6	108.8	109.2	24
7/14	107.9	108.3	109.0	22	112.9	113.7	114.2	24	108.9	109.6	110.7	24	---	---	---	0	109.2	109.6	110.0	24
7/15	107.0	107.6	108.0	24	112.6	113.3	114.7	24	108.0	108.5	109.1	24	---	---	---	0	109.1	109.3	109.5	24
7/16	110.7	113.3	116.4	24	115.2	117.0	119.2	24	108.9	109.9	110.5	24	---	---	---	0	110.2	111.5	112.2	24
7/17	107.0	107.5	107.8	24	111.9	112.8	114.2	24	109.0	109.7	110.4	24	---	---	---	0	110.8	110.9	111.1	24
7/18	106.6	107.0	107.5	24	111.7	112.3	113.2	24	109.1	109.5	109.9	24	---	---	---	0	110.4	110.7	110.9	24
7/19	106.4	107.0	107.5	24	111.8	112.8	113.4	23	109.5	109.9	110.2	24	111.9	112.0	112.2	17	109.8	110.0	110.1	24
7/20	106.7	107.3	107.8	24	112.4	113.1	113.4	24	---	---	---	0	---	---	---	0	---	---	---	0
7/21	107.4	108.6	112.2	23	112.5	113.6	115.7	22	---	---	---	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>Clrwr-Peck</u>			<u>Anatone</u>							
	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>					
	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>				
7/8	112.3	112.4	112.6	24	---	---	---	0	99.2	99.4	99.8	24	101.1	101.8	102.6	24	100.9	101.7	102.2	24
7/9	112.4	113.1	116.3	24	---	---	---	0	99.3	99.7	100.3	24	101.4	102.5	103.7	24	101.1	102.0	103.3	23
7/10	112.9	113.8	115.9	24	---	---	---	0	99.1	99.2	99.4	22	100.5	100.8	101.1	22	99.7	99.8	99.9	22
7/11	112.7	113.6	116.2	24	---	---	---	0	99.2	99.5	99.9	24	100.9	101.8	102.3	23	100.6	101.8	102.7	24
7/12	111.8	112.5	115.1	24	---	---	---	0	99.0	99.3	99.7	24	100.7	101.2	102.0	24	101.0	101.7	102.7	24
7/13	111.2	111.7	112.1	24	---	---	---	0	98.8	99.2	99.6	24	101.1	102.4	103.2	24	101.2	102.5	103.5	24
7/14	112.3	113.0	115.6	24	---	---	---	0	99.2	99.7	100.0	24	100.6	100.8	103.1	14	101.7	102.8	104.0	24
7/15	111.6	112.1	112.8	24	---	---	---	0	99.5	100.0	100.4	24	---	---	---	0	100.4	101.2	102.2	24
7/16	112.9	114.0	114.6	24	---	---	---	0	99.5	99.8	100.3	24	101.3	102.5	103.8	22	98.1	98.9	99.3	24
7/17	113.6	114.5	116.8	24	---	---	---	0	99.5	99.9	100.3	24	101.1	102.0	102.8	24	96.6	97.7	98.3	24
7/18	112.3	112.6	113.1	24	---	---	---	0	99.6	100.0	100.5	24	101.5	102.8	103.8	24	96.5	97.7	98.7	24
7/19	112.3	112.8	113.6	24	---	---	---	0	99.1	99.4	100.0	24	101.5	102.7	104.0	24	97.3	98.0	98.9	24
7/20	---	---	---	0	---	---	---	0	99.1	99.5	99.8	24	101.8	103.0	103.9	24	101.0	103.9	105.5	23
7/21	---	---	---	0	---	---	---	0	99.6	100.1	100.4	23	102.2	103.6	104.6	23	103.0	104.5	106.0	23

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

Date	<u>Clrwr-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>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>					
	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>				
7/8	102.2	103.3	103.9	24	101.6	101.9	102.8	24	110.5	110.9	111.2	24	107.2	107.5	108.3	24	111.3	111.7	112.3	24
7/9	103.1	105.3	107.6	24	102.1	102.3	102.8	24	110.4	110.9	111.2	24	107.3	107.8	108.8	24	111.5	112.0	112.2	24
7/10	101.4	102.1	102.4	24	101.9	102.0	102.3	24	110.4	110.6	110.9	24	106.5	106.7	106.9	24	111.5	111.7	111.9	24
7/11	102.7	104.9	106.1	24	101.4	101.6	101.9	24	110.1	110.6	111.0	24	106.3	106.6	107.0	24	109.9	110.9	111.4	24
7/12	102.0	103.5	105.1	24	101.0	101.4	101.5	24	109.2	110.2	110.9	24	106.0	106.2	106.4	24	108.7	109.0	109.4	24
7/13	103.3	106.0	107.8	24	99.1	99.4	99.8	24	109.7	110.5	111.4	24	104.4	104.8	105.1	24	108.1	108.5	108.8	24
7/14	103.8	106.5	108.3	24	99.2	99.5	100.2	24	110.1	110.4	111.2	24	105.0	105.3	106.1	24	108.2	108.8	109.1	24
7/15	103.7	106.2	108.0	24	100.8	101.5	101.8	24	110.0	110.6	111.1	24	106.0	106.5	107.4	24	108.4	108.9	109.3	24
7/16	103.4	105.8	107.5	24	101.6	102.0	102.4	24	110.4	110.8	111.2	24	106.6	107.0	107.7	24	108.6	109.2	109.7	24
7/17	103.2	105.4	106.7	24	102.8	103.3	104.1	24	110.8	111.1	111.3	24	107.0	107.8	109.5	24	108.3	108.9	109.4	24
7/18	103.4	105.8	107.4	24	103.5	103.7	104.0	24	110.3	110.6	111.1	24	107.4	107.7	108.3	24	108.4	108.8	108.9	24
7/19	103.4	105.7	107.3	24	101.7	102.0	102.7	24	109.8	110.2	110.5	24	108.1	108.4	108.9	24	108.9	109.3	109.6	24
7/20	103.8	106.3	107.9	24	101.4	101.7	102.1	24	110.6	111.4	111.8	24	107.7	107.9	108.1	24	109.0	109.5	109.8	24
7/21	104.2	106.9	108.6	23	101.7	102.1	102.8	23	112.0	112.4	112.7	23	107.9	108.2	109.2	23	109.4	110.0	110.2	23

### 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>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>					
	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>				
7/8	109.3	109.8	110.2	24	113.9	115.7	117.2	24	111.5	111.6	111.7	24	111.4	111.6	112.7	24	---	---	---	0
7/9	108.6	109.0	110.0	24	117.1	117.4	117.7	24	111.0	111.2	111.4	24	112.2	113.0	113.7	24	---	---	---	0
7/10	108.2	108.6	109.1	24	116.3	116.8	117.1	24	110.6	111.0	111.2	24	111.7	112.4	112.7	24	---	---	---	0
7/11	107.1	107.3	107.7	24	116.0	116.6	117.1	24	108.2	108.6	109.1	24	111.0	111.7	112.7	24	---	---	---	0
7/12	106.8	107.4	108.0	24	116.0	116.9	117.3	24	107.8	108.1	108.2	23	110.2	110.8	112.5	24	---	---	---	0
7/13	106.1	106.4	107.4	24	116.6	117.0	117.3	24	107.1	107.5	107.7	24	112.7	114.1	114.6	24	---	---	---	0
7/14	107.3	107.6	107.8	24	116.5	117.4	117.9	24	108.1	108.7	109.6	24	113.2	113.7	114.3	24	---	---	---	0
7/15	107.3	107.4	107.5	24	115.9	116.1	116.3	24	109.5	109.8	110.2	24	113.7	114.3	114.7	24	---	---	---	0
7/16	106.8	107.0	107.1	24	115.9	116.6	117.0	24	110.7	111.2	112.3	24	112.6	113.2	114.0	24	---	---	---	0
7/17	107.1	107.3	107.5	24	113.3	114.8	116.8	24	112.2	112.6	112.9	24	111.5	112.3	113.7	24	---	---	---	0
7/18	106.1	106.5	107.0	24	115.7	116.6	117.0	24	112.7	112.9	113.1	24	113.2	113.7	114.1	24	---	---	---	0
7/19	105.7	105.9	106.4	24	115.5	115.6	115.8	24	112.1	112.2	112.5	24	113.5	114.1	114.7	24	---	---	---	0
7/20	106.8	107.2	107.5	24	115.5	116.1	116.7	24	112.1	112.3	112.4	24	113.4	114.0	114.4	24	---	---	---	0
7/21	107.1	107.3	107.4	23	115.6	116.1	117.2	23	112.1	112.3	112.6	23	113.3	113.8	114.2	23	---	---	---	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>24 h</u>	<u>12 h</u>			<u>24h</u>	<u>12h</u>			<u>24h</u>	<u>12h</u>			<u>24h</u>	<u>12h</u>		
	<u>Avg</u>	<u>Avg</u>	<u>High</u>		<u>Avg</u>	<u>Avg</u>	<u>High</u>		<u>Avg</u>	<u>Avg</u>	<u>High</u>		<u>Avg</u>	<u>Avg</u>	<u>High</u>		<u>Avg</u>	<u>AVG</u>	<u>High</u>	
7/8	107.0	107.4	107.8	24	116.0	116.4	116.7	24	104.8	105.0	105.3	24	113.5	113.9	114.3	24	108.5	108.7	109.0	24
7/9	107.3	107.4	107.5	24	115.6	115.9	116.2	24	104.8	105.1	105.4	24	113.9	114.3	114.6	24	108.2	108.6	108.9	24
7/10	106.3	106.5	106.8	24	114.1	114.4	114.5	24	105.0	105.2	105.4	24	113.3	113.4	113.8	24	106.6	107.0	107.1	24
7/11	105.2	105.5	106.1	24	114.1	115.0	115.7	24	104.6	105.1	105.6	24	114.0	114.2	114.7	24	105.0	105.3	105.4	24
7/12	105.5	105.7	106.0	24	114.7	115.7	116.2	24	104.6	104.8	105.1	24	113.5	113.8	114.0	24	106.8	107.6	107.8	24
7/13	104.5	104.7	105.5	24	115.1	116.0	116.6	24	103.5	103.8	104.0	24	113.5	114.1	114.5	24	105.6	106.2	106.9	24
7/14	106.1	106.6	107.1	24	115.2	116.4	116.8	24	103.2	103.4	103.6	24	113.3	113.7	114.0	24	106.5	106.7	106.8	24
7/15	106.7	107.2	107.8	24	115.5	116.2	116.5	24	102.8	103.0	103.2	24	112.5	112.7	113.1	24	105.0	105.4	105.8	24
7/16	108.2	108.7	109.1	24	115.9	116.3	116.7	24	102.7	103.1	103.3	24	112.7	113.0	113.1	22	104.9	105.2	105.3	22
7/17	109.0	109.2	109.4	24	115.6	115.9	116.1	24	103.4	104.0	104.9	24	114.1	114.5	114.8	24	106.8	107.3	107.6	24
7/18	108.1	108.4	108.9	24	115.5	116.6	117.2	24	104.2	104.4	105.2	24	112.8	113.1	113.4	24	106.2	106.7	107.0	24
7/19	107.3	107.6	107.9	24	115.8	116.3	116.7	24	104.5	105.0	105.3	24	112.5	112.7	112.8	24	106.0	106.4	107.1	24
7/20	107.5	107.8	108.0	24	115.0	115.5	115.8	24	105.1	105.5	105.8	24	113.1	113.5	113.8	24	107.9	108.3	108.5	24
7/21	108.0	108.3	108.6	23	115.7	116.2	116.7	23	106.0	106.6	107.2	23	113.5	113.9	114.6	23	109.1	109.8	110.2	23

### 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>24 h</u>	<u>12 h</u>			<u>24h</u>	<u>12h</u>			<u>24h</u>	<u>12h</u>			<u>24h</u>	<u>12h</u>		
	<u>Avg</u>	<u>Avg</u>	<u>High</u>		<u>Avg</u>	<u>Avg</u>	<u>High</u>		<u>Avg</u>	<u>Avg</u>	<u>High</u>		<u>Avg</u>	<u>Avg</u>	<u>High</u>		<u>Avg</u>	<u>Avg</u>	<u>High</u>	
7/8	113.6	114.0	114.3	24	108.9	109.3	109.6	24	115.8	116.4	117.0	24	111.0	111.9	112.4	24	116.7	116.8	117.2	24
7/9	113.2	113.7	114.0	24	109.3	109.4	109.7	24	116.0	116.4	116.9	24	111.8	112.6	113.4	24	116.9	117.1	117.3	24
7/10	111.8	112.0	112.3	24	108.9	109.0	109.2	24	116.7	117.1	117.4	24	112.1	113.1	114.4	24	116.9	117.1	117.2	24
7/11	111.1	111.7	112.2	24	107.1	107.6	108.1	24	116.5	117.0	117.3	24	113.7	115.2	115.8	24	116.7	116.8	116.9	24
7/12	111.6	111.9	112.4	24	106.4	106.9	107.5	24	115.8	116.1	116.6	24	113.2	113.9	115.1	24	116.7	116.8	117.0	24
7/13	112.2	112.7	112.9	24	106.3	106.9	107.3	24	115.7	116.2	116.8	24	112.6	114.0	114.9	24	116.6	116.8	116.9	24
7/14	112.3	112.7	113.4	24	106.8	107.3	107.7	24	115.1	115.8	116.5	24	112.0	112.7	113.3	24	116.6	116.7	117.0	24
7/15	111.4	111.7	111.9	24	106.1	106.3	106.7	24	115.2	115.7	116.0	24	110.4	111.6	112.7	24	116.7	116.8	116.9	24
7/16	111.2	111.7	112.0	24	105.2	105.5	106.2	24	115.3	115.5	115.8	24	111.7	112.7	113.5	24	116.8	116.9	117.1	24
7/17	112.4	113.0	113.5	24	105.7	105.8	105.9	24	115.3	115.6	115.9	24	111.6	112.2	112.6	24	116.9	117.0	117.0	24
7/18	111.9	112.3	112.8	24	105.8	105.9	106.4	24	115.7	116.5	117.1	24	111.6	112.3	113.1	24	116.6	116.8	117.0	24
7/19	111.7	112.1	112.3	24	107.1	107.6	107.9	24	115.0	115.8	116.1	24	112.2	112.7	113.4	24	116.6	116.8	116.9	24
7/20	112.4	113.3	113.8	24	108.0	108.6	108.9	23	116.4	117.2	117.7	24	112.5	114.0	115.1	24	116.8	117.2	117.5	24
7/21	114.0	114.9	115.2	23	108.8	109.3	109.5	23	116.2	116.7	117.1	23	114.2	115.0	115.9	23	117.1	117.4	117.5	23

## Two-Week Summary of Passage Indices

Source: Fish Passage Center

Updated: 7/22/2016 9:00

### Two-Week Summary of Passage Indices

\* One or more of the sites on this date had an incomplete or biased sample.

See Sampling Comments: <http://www.fpc.org/currentDaily/smpcomments.htm>

For clip information see: <http://www.fpc.org/CurrentDaily/catch.htm>

For sockeye and yearling chinook (Snake only) race information see: <http://www.fpc.org/smoltqueries/currentsmppsubmitdata.asp>

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)
07/08/2016 *	---	9	---	---	0	0	100	0	0	---	0
07/09/2016 *	---	---	---	---	0	0	66	0	---	0	0
07/10/2016 *	---	---	---	---	0	0	75	0	0	---	0
07/11/2016 *	---	15	---	---	48	0	24	0	---	0	0
07/12/2016 *	---	10	---	---	0	0	20	0	0	---	0
07/13/2016 *	---	9	---	---	38	0	0	0	---	0	0
07/14/2016 *	---	3	---	---	0	0	0	0	0	---	0
07/15/2016 *	---	2	---	---	0	0	11	0	---	0	0
07/16/2016 *	---	---	---	---	0	0	0	0	0	---	0
07/17/2016 *	---	---	---	---	4	0	0	0	---	0	0
07/18/2016 *	---	3	---	---	0	0	0	0	0	---	0
07/19/2016 *	---	2	---	---	0	0	0	0	---	0	0
07/20/2016 *	---	0	---	---	0	0	9	0	0	---	0
07/21/2016 *	---	1	---	---	0	0	4	0	---	0	0
07/22/2016	---	---	---	---	---	---	---	---	0	---	---
<b>Total:</b>	<b>0</b>	<b>54</b>	<b>0</b>	<b>0</b>	<b>90</b>	<b>0</b>	<b>309</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b># Days:</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>8</b>	<b>7</b>	<b>14</b>
<b>Average:</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>YTD</b>	<b>27,295</b>	<b>56,779</b>	<b>16,183</b>	<b>7,757</b>	<b>5,899,034</b>	<b>3,490,950</b>	<b>4,892,127</b>	<b>44,783</b>	<b>2,181,660</b>	<b>1,456,048</b>	<b>2,660,728</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)
07/08/2016 *	---	1	---	---	6,048	1,707	6,162	271	39,680	---	57,234
07/09/2016 *	---	---	---	---	8,319	4,530	3,276	177	---	12,224	46,287
07/10/2016 *	---	---	---	---	12,559	5,866	1,835	139	24,620	---	12,345
07/11/2016 *	---	1	---	---	8,381	3,071	891	121	---	6,764	2,698
07/12/2016 *	---	1	---	---	7,019	2,064	1,809	100	27,313	---	4,962
07/13/2016 *	---	0	---	---	5,154	5,533	1,124	107	---	5,565	7,964
07/14/2016 *	---	1	---	---	2,123	4,418	575	90	21,916	---	18,885
07/15/2016 *	---	0	---	---	1,207	3,253	478	84	---	10,719	18,437
07/16/2016 *	---	---	---	---	673	2,770	352	100	14,762	---	15,976
07/17/2016 *	---	---	---	---	972	2,054	438	93	---	4,464	14,401
07/18/2016 *	---	0	---	---	1,236	2,080	95	68	5,721	---	14,290
07/19/2016 *	---	0	---	---	811	1,084	42	359	---	1,751	47,220
07/20/2016 *	---	0	---	---	777	514	181	171	2,070	---	84,401
07/21/2016 *	---	0	---	---	1,000	511	67	121	---	1,012	49,521
07/22/2016	---	---	---	---	---	---	---	---	2,935	---	---
<b>Total:</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>56,279</b>	<b>39,455</b>	<b>17,325</b>	<b>2,001</b>	<b>139,017</b>	<b>42,499</b>	<b>394,621</b>
<b># Days:</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>8</b>	<b>7</b>	<b>14</b>
<b>Average:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4,020</b>	<b>2,818</b>	<b>1,238</b>	<b>143</b>	<b>17,377</b>	<b>6,071</b>	<b>28,187</b>
<b>YTD</b>	<b>0</b>	<b>78</b>	<b>698</b>	<b>2,869</b>	<b>1,139,746</b>	<b>856,239</b>	<b>326,326</b>	<b>19,537</b>	<b>4,322,856</b>	<b>938,026</b>	<b>2,823,808</b>

## Two-Week Summary of Passage Indices

COMBINED COHO												
Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO2 (INDEX)	
07/08/2016	*	---	0	---	---	0	0	0	0	0	---	0
07/09/2016	*	---	---	---	---	0	0	0	1	---	0	0
07/10/2016	*	---	---	---	---	0	0	0	0	0	---	0
07/11/2016	*	---	0	---	---	0	0	0	0	---	0	0
07/12/2016	*	---	0	---	---	0	0	0	0	0	---	0
07/13/2016	*	---	0	---	---	0	0	0	0	---	0	16
07/14/2016	*	---	0	---	---	0	0	0	0	0	---	0
07/15/2016	*	---	0	---	---	0	0	0	0	---	0	0
07/16/2016	*	---	---	---	---	0	0	0	0	0	---	0
07/17/2016	*	---	---	---	---	0	0	0	1	---	0	0
07/18/2016	*	---	0	---	---	0	0	0	0	0	---	0
07/19/2016	*	---	0	---	---	0	0	0	1	---	0	0
07/20/2016	*	---	0	---	---	0	0	0	0	0	---	0
07/21/2016	*	---	0	---	---	0	0	0	0	---	0	0
07/22/2016		---	---	---	---	---	---	---	---	0	---	---
<hr/>												
<b>Total:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>16</b>	
<b># Days:</b>		<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>8</b>	<b>7</b>	<b>14</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>1</b>	
<b>YTD</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>316</b>	<b>198,063</b>	<b>147,678</b>	<b>60,123</b>	<b>45,366</b>	<b>154,245</b>	<b>58,662</b>	<b>802,520</b>

COMBINED STEELHEAD												
Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO2 (INDEX)	
07/08/2016	*	---	0	---	---	42	0	0	0	0	---	0
07/09/2016	*	---	---	---	---	92	0	0	0	---	0	0
07/10/2016	*	---	---	---	---	44	0	0	4	0	---	0
07/11/2016	*	---	2	---	---	48	0	24	7	---	0	0
07/12/2016	*	---	0	---	---	83	23	0	1	0	---	0
07/13/2016	*	---	0	---	---	0	11	0	0	---	0	0
07/14/2016	*	---	1	---	---	40	7	0	1	0	---	0
07/15/2016	*	---	0	---	---	20	21	0	1	---	0	0
07/16/2016	*	---	---	---	---	20	22	0	1	0	---	0
07/17/2016	*	---	---	---	---	22	14	0	0	---	0	0
07/18/2016	*	---	0	---	---	88	29	0	0	0	---	0
07/19/2016	*	---	0	---	---	40	16	0	3	---	0	0
07/20/2016	*	---	0	---	---	8	0	0	1	0	---	0
07/21/2016	*	---	0	---	---	17	18	0	0	---	0	0
07/22/2016		---	---	---	---	---	---	---	---	0	---	---
<hr/>												
<b>Total:</b>		<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>564</b>	<b>161</b>	<b>24</b>	<b>19</b>	<b>0</b>	<b>0</b>	
<b># Days:</b>		<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>8</b>	<b>7</b>	<b>14</b>	
<b>Average:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>12</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	
<b>YTD</b>		<b>755</b>	<b>26,537</b>	<b>3,377</b>	<b>9,186</b>	<b>3,956,915</b>	<b>2,295,084</b>	<b>1,838,045</b>	<b>17,660</b>	<b>735,162</b>	<b>502,821</b>	<b>622,598</b>

## Two-Week Summary of Passage Indices

COMBINED SOCKEYE											
Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO2 (INDEX)
07/08/2016	*	---	0	---	0	0	0	1	0	---	0
07/09/2016	*	---	---	---	0	0	0	0	---	0	0
07/10/2016	*	---	---	---	0	0	0	1	0	---	0
07/11/2016	*	---	0	---	0	0	0	0	0	---	0
07/12/2016	*	---	0	---	0	0	0	0	0	---	0
07/13/2016	*	---	0	---	0	0	0	3	---	16	57
07/14/2016	*	---	0	---	0	0	0	0	103	---	0
07/15/2016	*	---	0	---	0	0	0	0	0	46	0
07/16/2016	*	---	---	---	0	0	0	0	0	---	0
07/17/2016	*	---	---	---	0	0	0	0	---	0	0
07/18/2016	*	---	0	---	0	0	0	0	0	---	0
07/19/2016	*	---	0	---	0	0	0	4	---	0	0
07/20/2016	*	---	0	---	0	0	0	0	0	---	0
07/21/2016	*	---	0	---	0	0	0	4	---	0	0
07/22/2016		---	---	---	---	---	---	---	0	---	---
<b>Total:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>103</b>	<b>62</b>	<b>57</b>
<b># Days:</b>		<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>8</b>	<b>7</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>13</b>	<b>9</b>	<b>4</b>
<b>YTD</b>		<b>1</b>	<b>0</b>	<b>0</b>	<b>133</b>	<b>43,851</b>	<b>32,770</b>	<b>24,148</b>	<b>56,630</b>	<b>861,051</b>	<b>303,199</b>

COMBINED LAMPREY JUVENILES											
Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR <sup>†</sup> (Samp)	LGS (Coll)	LMN (Coll)	RIS (Coll)	MCN (Coll)	JDA (Coll)	BO2 (Coll)
07/08/2016	*	---	0	---	0	20	0	1	0	---	0
07/09/2016	*	---	---	---	0	10	10	2	---	0	0
07/10/2016	*	---	---	---	0	20	10	1	0	---	0
07/11/2016	*	---	0	---	0	25	0	0	---	50	0
07/12/2016	*	---	0	---	0	12	0	0	50	---	0
07/13/2016	*	---	0	---	0	12	5	0	---	30	10
07/14/2016	*	---	0	---	0	10	5	0	0	---	10
07/15/2016	*	---	0	---	1	35	0	1	---	10	0
07/16/2016	*	---	---	---	0	5	0	0	0	---	0
07/17/2016	*	---	---	---	0	35	0	0	---	40	0
07/18/2016	*	---	0	---	5	0	5	1	0	---	0
07/19/2016	*	---	0	---	0	10	0	5	---	0	0
07/20/2016	*	---	0	---	1	4	0	0	0	---	0
07/21/2016	*	---	0	---	8	0	0	1	---	5	0
07/22/2016		---	---	---	---	---	---	---	0	---	---
<b>Total:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>198</b>	<b>35</b>	<b>12</b>	<b>50</b>	<b>135</b>	<b>20</b>
<b># Days:</b>		<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>8</b>	<b>7</b>	<b>14</b>
<b>Average:</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>14</b>	<b>3</b>	<b>1</b>	<b>6</b>	<b>19</b>	<b>1</b>
<b>YTD</b>		<b>0</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>185</b>	<b>34,573</b>	<b>29,675</b>	<b>107</b>	<b>34,393</b>	<b>26,178</b>

## Two-Week Summary of Passage Indices

\* 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, sockeye, and lamprey juveniles.

Two classes of fish counts are shown in these tables:

Sample counts (Samp) are provided for juvenile lamprey at LGR. See note below for details †.

Collection counts (Coll), which account for sample rates but are not adjusted for flow;

Passage indices (INDEX), 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.

Combined lamprey juvenile collection counts are provided for all sites. Combined lamprey juveniles is a combination of pacific lamprey ammocoetes, brook lamprey ammocoetes, unknown lamprey ammocoetes, pacific lamprey macrophthalmia, and unidentified lamprey species.

† In 2013 it was confirmed that juvenile lamprey can escape the sample tank at LGR which would lead to unreliable estimates of collection.

Therefore, only sample counts are provided in this report.

### 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.

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.

Fall (post SMP season) trapping at the Imnaha River Fish Trap (IMN) is funded by the Lower Snake River Compensation Program (LSRCP)

WTB and LEW data collected for the FPC by Idaho Dept. of Fish and Game.



## Two Week Transportation Summary

Source: Fish Passage Center

Updated:

7/22/16 9:01 AM

**07/08/16 TO 07/22/16**

		Species			
Site	Data	CH0	CH1	ST	Grand Total
<b>LGR</b>	Sum of NumberCollected	25,973	42	256	26,271
	Sum of NumberBarged	28,436	42	263	28,741
	Sum of NumberBypassed	0	0	0	0
	Sum of Numbertrucked	0	0	0	0
	Sum of SampleMorts	25	0	1	26
	Sum of FacilityMorts	52	0	3	55
	Sum of ResearchMorts	0	0	0	0
	Sum of TotalProjectMorts	77	0	4	81
<b>LGS</b>	Sum of NumberCollected	26,561		112	26,673
	Sum of NumberBarged	28,173		97	28,270
	Sum of NumberBypassed	0		0	0
	Sum of Numbertrucked	0		0	0
	Sum of SampleMorts	43		0	43
	Sum of FacilityMorts	183		3	186
	Sum of ResearchMorts	0		0	0
	Sum of TotalProjectMorts	226		3	229
<b>LMN</b>	Sum of NumberCollected	8,182	141	10	8,333
	Sum of NumberBarged	11,601	199	9	11,809
	Sum of NumberBypassed	60	0	0	60
	Sum of Numbertrucked	0	0	0	0
	Sum of SampleMorts	6	0	0	6
	Sum of FacilityMorts	12	0	1	13
	Sum of ResearchMorts	0	0	0	0
	Sum of TotalProjectMorts	18	0	1	19
Total Sum of NumberCollected		60,716	183	378	61,277
Total Sum of NumberBarged		68,210	241	369	68,820
Total Sum of NumberBypassed		60	0	0	60
Total Sum of Numbertrucked		0	0	0	0
Total Sum of SampleMorts		74	0	1	75
Total Sum of FacilityMorts		247	0	7	254
Total Sum of ResearchMorts		0	0	0	0
Total Sum of TotalProjectMorts		321	0	8	329

### YTD Transportation Summary

Source: Fish Passage Center

Updated:

7/22/16 9:01 AM

**TO: 07/22/16**

		Species					
Site	Data	CH0	CH1	CO	SO	ST	Grand Total
<b>LGR</b>	Sum of NumberCollected	737,556	4,509,994	150,410	33,350	2,985,953	8,417,263
	Sum of NumberBarged	702,878	1,403,203	117,275	31,849	1,109,872	3,365,077
	Sum of NumberBypassed	31,770	3,104,914	33,069	650	1,875,866	5,046,269
	Sum of NumberTrucked	0	0	0	0	0	0
	Sum of SampleMorts	100	94	1	16	36	247
	Sum of FacilityMorts	2,133	1,361	65	830	103	4,492
	Sum of ResearchMorts	202	422	0	5	68	697
	Sum of TotalProjectMorts	2,435	1,877	66	851	207	5,436
<b>LGS</b>	Sum of NumberCollected	595,773	2,438,120	104,356	22,898	1,600,507	4,761,654
	Sum of NumberBarged	591,594	1,022,198	90,698	22,682	670,640	2,397,812
	Sum of NumberBypassed	2,872	1,415,436	13,600	7	929,747	2,361,662
	Sum of NumberTrucked	0	0	0	0	0	0
	Sum of SampleMorts	84	23	1	22	12	142
	Sum of FacilityMorts	899	463	57	187	96	1,702
	Sum of ResearchMorts	0	0	0	0	0	0
	Sum of TotalProjectMorts	983	486	58	209	108	1,844
<b>LMN</b>	Sum of NumberCollected	182,889	3,510,219	40,585	11,370	1,285,388	5,030,451
	Sum of NumberBarged	179,544	1,897,386	34,346	11,348	630,482	2,753,106
	Sum of NumberBypassed	2,568	1,612,351	6,238	0	654,785	2,275,942
	Sum of NumberTrucked	0	0	0	0	0	0
	Sum of SampleMorts	44	127	0	5	23	199
	Sum of FacilityMorts	141	353	1	18	98	611
	Sum of ResearchMorts	0	0	0	0	0	0
	Sum of TotalProjectMorts	185	480	1	23	121	810
<b>Total Sum of NumberCollected</b>		<b>1,516,218</b>	<b>10,458,333</b>	<b>295,351</b>	<b>67,618</b>	<b>5,871,848</b>	<b>18,209,368</b>
<b>Total Sum of NumberBarged</b>		<b>1,474,016</b>	<b>4,322,787</b>	<b>242,319</b>	<b>65,879</b>	<b>2,410,994</b>	<b>8,515,995</b>
<b>Total Sum of NumberBypassed</b>		<b>37,210</b>	<b>6,132,701</b>	<b>52,907</b>	<b>657</b>	<b>3,460,398</b>	<b>9,683,873</b>
<b>Total Sum of NumberTrucked</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Sum of SampleMorts</b>		<b>228</b>	<b>244</b>	<b>2</b>	<b>43</b>	<b>71</b>	<b>588</b>
<b>Total Sum of FacilityMorts</b>		<b>3,173</b>	<b>2,177</b>	<b>123</b>	<b>1,035</b>	<b>297</b>	<b>6,805</b>
<b>Total Sum of ResearchMorts</b>		<b>202</b>	<b>422</b>	<b>0</b>	<b>5</b>	<b>68</b>	<b>697</b>
<b>Total Sum of TotalProjectMorts</b>		<b>3,603</b>	<b>2,843</b>	<b>125</b>	<b>1,083</b>	<b>436</b>	<b>8,090</b>

**Cumulative Adult Passage at Mainstem Dams Through: 07/21**

DAM	ENDDATE	Spring Chinook						Summer Chinook						Fall Chinook					
		2016		2015		10-Yr Avg.		2016		2015		10-Yr Avg.		2016		2015		10-Yr Avg.	
		Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack
BON	07/20	137215	11145	220480	13314	146704	24884	109607	9730	147131	16099	89246	19853	0	0	0	0	0	0
TDA	07/21	105504	9999	194116	12307	114381	21222	87022	7798	110595	13867	74182	15696	0	0	0	0	0	0
JDA	07/20	93659	8262	166015	11514	99110	19896	81607	6603	93955	9366	64670	14895	0	0	0	0	0	0
MCN	07/21	82626	7237	156151	8767	89797	16347	74187	5567	81321	7350	59803	11183	0	0	0	0	0	0
IHR	07/21	67484	5029	116462	5745	63912	10829	12216	1365	19817	2671	17313	4579	0	0	0	0	0	0
LMN	07/21	66115	6268	111511	8697	63840	10328	10705	2074	16069	4384	18483	5302	0	0	0	0	0	0
LGS	07/21	62597	6365	105124	8553	59587	11445	10583	1756	13624	4002	17220	5813	0	0	0	0	0	0
LGR	07/21	62050	5480	104873	8379	58449	12640	9928	1794	12128	3424	15209	6095	0	0	0	0	0	0
PRD	07/19	16843	1003	27716	1570	17080	1731	65712	3457	55327	2680	42937	1379	0	0	0	0	0	0
WAN	07/19	17164	919	25982	1077	16645	2069	62828	2708	53175	1407	39919	1138	0	0	0	0	0	0
RIS	07/20	18646	715	31748	1092	17101	2726	61029	1848	57725	1513	40198	3046	0	0	0	0	0	0
RRH	07/20	9449	351	15244	609	7441	1202	40862	1186	45633	1029	27945	1876	0	0	0	0	0	0
WEL	07/20	11789	833	19971	1520	7481	1542	25884	992	29952	1649	18381	1384	0	0	0	0	0	0
WFA	07/17	28403	2006	50005	1992	34424	1174	0	0	0	0	0	0	0	0	0	0	0	0

DAM	ENDDATE	Coho						Sockeye			Steelhead						Lamprey			
		2016		2015		10-Yr Avg.		2016	2015	10-Yr Avg.	2016	2015	10-Yr Avg.	2016	Wild	Wild	10-Yr	2016	2015	10-Yr
		Adult	Jack	Adult	Jack	Adult	Jack													
BON	07/20	0	0	0	0	0	0	338035	499843	281993	38811	31691	55947	15848	17642	25678	26019	22720	13172	
TDA	07/21	0	0	0	0	0	0	285216	417246	240307	15539	11156	31436	7420	6574	15039	5280	8536	3139	
JDA	07/20	0	0	0	0	0	1	285388	350854	230509	9254	6813	23829	5026	3926	10233	4533	5467	2108	
MCN	07/21	-1	0	13	5	1	0	258339	268345	199279	7706	5639	17309	3962	2882	6444	494	929	285	
IHR	07/21	0	0	0	0	0	0	862	919	784	4964	3928	10815	2344	1806	3149	362	374	52	
LMN	07/21	-2	0	0	0	0	0	956	816	906	4599	5405	13581	2653	2747	4431	76	92	9	
LGS	07/21	0	0	0	0	0	0	880	495	814	5286	2125	5445	3023	1351	2309	54	75	4	
LGR	07/21	0	0	0	0	0	0	740	321	797	6978	9613	11048	3988	4589	4165	18	19	0	
PRD	07/19	0	1	0	0	0	0	302516	285613	223582	1133	1239	1153	0	0	0	1378	2449	413	
WAN	07/19	0	0	0	0	0	0	310425	278527	186895	1038	907	1137	0	0	0	603	1358	219	
RIS	07/20	0	0	0	0	0	0	297142	250321	209556	680	686	802	347	456	435	115	318	37	
RRH	07/20	0	0	0	0	0	0	223969	203092	171764	409	395	735	166	256	405	60	204	14	
WEL	07/20	0	0	0	0	0	0	201048	174562	153063	279	187	263	119	120	149	1	0	0	
WFA	07/17	0	0	1	0	0	0	0	0	0	24660	6831	21073	0	0	0	0	0	0	

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.

### Columbia/Snake Project Forebay Temperatures

