



Fish Passage Center

Weekly Report #16–23

August 19, 2016

Summary of Events

Water Supply

Precipitation throughout the Columbia Basin has varied between 19% and 111% of average at individual sub-basins over August. Precipitation above The Dalles has been 44% of average over early August. Over the 2016 water year, precipitation has ranged between 82% and 105% of average.

Table 1. Summary of August precipitation and cumulative October through August 17th precipitation with respect to average (1981–2010), at select locations within the Columbia and Snake River Basins.

Location	Water Year 2016		Water Year 2016	
	August 1–17, 2016		October 1, 2015 to August 17, 2016	
	Observed (inches)	% Average	Observed (inches)	% Average
Columbia above Coulee	0.68	66	34.2	98
SNAKE RIVER above Ice Harbor	0.08	19	19.3	90
Columbia above The Dalles	0.27	44	24.9	96
Kootenai	0.85	79	34.0	97
Clark Fork	0.38	46	22.0	85
Flathead	0.99	111	35.3	105
Pend Oreille River Basin above Waneta Dam	0.58	70	29.5	96
Salmon River Basin	0.12	19	24.3	89
Upper Snake Tributaries	0.18	25	20.3	82
Clearwater	0.20	27	37.4	97
Willamette River above Portland	0.10	20	66.9	105

Table 2 displays the August 18th ESP runoff volume forecasts for multiple reservoirs along with the June COE forecasts at Libby and Dworshak. The August 18th ESP forecast at The Dalles between April and August is 78,464 Kaf (90% of average).

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

Location	August 18, 2016	
	% Average (1981–2010)	Runoff Volume (Kaf)
The Dalles (Apr–Aug)	90	78,464
Grand Coulee (Apr–Aug)	92	52,074
Libby Res. Inflow, MT (Apr–Aug)	92 110*	5,419 6,445*
Hungry Horse Res. Inflow, MT (Apr–Aug)	87	1,679
Lower Granite Res. Inflow (Apr–July)	83	16,494
Brownlee Res. Inflow (Apr–July)	72	3,961
Dworshak Res. Inflow (Apr–July)	85 86*	2,064 2,057*

* Denotes COE June Forecast

Grand Coulee Reservoir is at 1,283.2 feet (8-17-16) and drafted 1.5 feet over the last week. Outflows at Grand Coulee have ranged between 89.9 and 102.1 Kcfs over the last week.

The Libby Reservoir is currently at elevation 2,447.6 feet (8-17-16) and has refilled 0.1 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 3,555.9 feet (8-17-16) and has drafted 0.9 feet over the last week. Outflows at Hungry Horse have been 2.0 Kcfs over the last week.

Dworshak is currently at an elevation of 1,548.4 feet (8-17-16) and has drafted 7.1 feet over the last week. Dworshak outflows over the last week ranged from 7.8 Kcfs to 10.1 Kcfs.

The Brownlee Reservoir was at an elevation of 2,054.4 feet on August 17th, 2016, and has drafted 2.1 ft. over the last week. Outflows at Hells Canyon have ranged between 8.1 and 18.8 Kcfs over the last week.

The Summer Biological Opinion flow period began on June 21st with a flow objective of 50.4 Kcfs at Lower Granite. Over the Summer Flow Period, flows at Lower Granite Dam have averaged 32.9 Kcfs and 25.2 Kcfs over the last week.

The Summer Biological Opinion Flow Objectives will be 200 Kcfs at McNary Dam (began July 1st). Over the Summer Flow Period, flows at McNary have averaged 154.2 Kcfs and 136.6 Kcfs last week.

Spill and River Temperature

No spill has occurred at Dworshak Dam over the past week.

Summer spill for juvenile fish passage began on June 21st and will continue through August 31st. 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	July 13-August 31: 45 Kcfs/Gas Cap

At Lower Granite Dam the removable spillway weir was closed on June 29th 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. Over the past week spill occurred as all flow in excess of that needed for the operation of one turbine unit and ranged from a daily average of 9.7 to 16.1 Kcfs. At Little Goose Dam spill was changed on July 6th from spilling 30% of instantaneous flow, to a fixed volume spill operation to maintain compatibility with Lower Granite and Lower Monumental operations. Presently, spill is a fixed volume of 8.9 Kcfs. Spill over the past week ranged from a daily average of 7.2 to 13.5 Kcfs, with the higher

amounts due to double testing at the project. At Lower Monumental Dam spill is supposed to equal 17 Kcfs, but with the low flows in the Snake it is occurring as all flow in excess of that needed to operate one turbine unit. Total daily spill over the past week ranged from 6.8 Kcfs to 13.4 Kcfs. At Ice Harbor Dam spill has also occurred as all flow in excess of that needed for the operation of one turbine unit. Spill has ranged from a daily average of 10.5 to 18.2 Kcfs.

Summer spill for fish passage began on June 16th 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	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. During some periods spill was less than the 95 Kcfs, but was equal to all flow in excess of powerhouse minimums.

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 has precluded sampling for GBT at the SMP sites. Consequently, monitoring for GBT has concluded for the season.

Temperature: At present, water temperatures are above the 68°F temperature standard at the forebays of Bonneville, McNary and Ice Harbor dams. The forebay temperatures at Lower Granite Dam are warmer than last week. The daily average temperature in the Lower Granite forebay for August 18th was 65.3° F. It is above 70°F (70.3°F) downstream at the forebay of Ice Harbor Dam, where the temperature is about the same as last week. At McNary and Bonneville dams the forebay temperatures were 71°F and 70.8°F, respectively on August 18th. These forebay temperatures are about equal to the ten year averages observed at these projects.

Smolt Monitoring

Smolt Monitoring Program (SMP) sampling was ongoing at all SMP bypass facilities this week. High temperature sampling protocols remained in effect at Bonneville, John Day, and McNary dams this week. Subyearling Chinook dominated this week's samples at all of the SMP bypass facilities. When compared to the previous week, subyearling Chinook passage decreased at the Middle Columbia bypass facilities and most of the Snake River facilities, while remaining the same at Rock Island and Lower Monumental dams. Truck transportation began this week at all transportation sites, with the first truck leaving each collector project on August 17th.

The high temperature sampling protocol remained in effect at Bonneville Dam (BON) this week. Under this sampling protocol, sampling at BON occurs every-other-day (24-hour sample), with a target sample size of 100 fish. This sampling protocol will remain in place until temperatures in the Bonneville Forebay drop below 69.5°F. Samples at BON continued to be dominated by subyearling Chinook this week. This week's daily average passage index for subyearling Chinook at BON

was approximately 475 per day, which is very similar to last week's daily average passage index of about 500 per day. No spring migrants were encountered in this week's samples at BON. Furthermore, the only lamprey juveniles that were encountered at BON this week were Pacific ammocoetes, which were encountered in two of this week's four samples (August 12th and 16th).

The high temperature sampling protocol remained in effect at John Day Dam (JDA) this week. Under this protocol, sampling at JDA occurs twice per week (6-hour sample) for condition only. These condition monitoring samples will occur on Mondays and Thursdays, with FPC receiving the data on Tuesdays and Fridays. The high temperature protocol will remain in place until temperatures in the John Day Forebay drop below 69.5°F. Because the high temperature protocol at JDA calls for a partial sample (i.e., 6-hour sample), it is not appropriate to use the passage index as a measure of magnitude of juvenile passage. Subyearling Chinook dominated the collections at JDA this week. In fact, subyearling Chinook were the only target species encountered this week's two condition samples at JDA.

The high temperature sampling protocol remained in effect at McNary Dam (MCN) this week. Under this sampling protocol, sampling at MCN remains every-other-day (24-hour sample), with a reduced target sample size of 100 fish. This sampling protocol will remain in place until temperatures in the McNary Forebay drop below 69.5°F. This week's samples at MCN were dominated by subyearling Chinook, with a daily average passage index of about 70 per day. This is a decrease over last week's daily average passage index of about 160 subyearling Chinook per day. No spring migrants were encountered in this week's samples. Pacific lamprey macropthalmia were encountered in two of this week's three samples (August 13th and 17th).

During truck transport at Lower Granite Dam (LGR), fish may be held in the sample tank for up to 48-hours prior to being enumerated by SMP personnel. This means that the FPC now receives data from two sample days, every-other-day. Therefore, SMP data from LGR may be slightly delayed. This week's samples at Lower Granite Dam (LGR) were again dominated by subyearling Chinook, with a daily average passage index of approximately 900 per day. This is a decrease over last week's daily average passage index of about 1,800 subyearling Chinook per day. The only

spring migrants that were encountered in this week's samples were steelhead. Finally, both Pacific lamprey ammocoetes and macrophthalmia were encountered in one this week's samples. Pacific ammocoetes were encountered on August 16th and macrophthalmia were encountered on August 14th.

Unlike LGR, fish continue to be enumerated every day at Little Goose Dam (LGS) during truck transport and, therefore, there are no delays in FPC receiving sample data. Subyearling Chinook dominated this week's collections at LGS. This week's daily average passage index for subyearling Chinook at LGS was about 340 per day, which is a decrease from last week's daily passage index of about 775. The only spring migrants that were encountered in this week's samples were steelhead, but in very low numbers. Finally, Pacific lamprey ammocoetes were encountered in one of this week's samples (August 17th) while Pacific macrophthalmia were encountered every day this week. This week's daily average collection for Pacific macrophthalmia at LGS was three fish per day.

Similar to LGR, fish may be held in the sample tank for up to 48-hours at Lower Monumental Dam (LMN) prior to being enumerated by SMP personnel. Therefore, the FPC receives data from two sample days, every-other-day, and data from LMN may be slightly delayed. This week's samples at LMN were again dominated by subyearling Chinook, with a daily average passage index of only about 40 per day, which is very similar to last week's daily average passage index for subyearling Chinook at LMN. The only spring migrants that were encountered in this week's samples at LMN were steelhead (August 17th). Finally, Pacific lamprey macrophthalmia were encountered in two of this week's samples (August 12th and 14th).

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 7 per day, which is similar to last week's daily average passage index of about 11 per day. Yearling Chinook, sockeye, and steelhead were all encountered in one of this week's samples but in extremely low numbers. Finally, no lamprey juveniles were encountered in this week's samples at RIS.

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 releases were scheduled for this zone this week. However, approximately 300,000 spring Chinook pre-smolts are scheduled for release into the Selway River, a tributary of the Clearwater River, on or around September 1st. These spring Chinook pre-smolts are 100% unmarked and are not expected to out-migrate until spring of 2017.

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

The adult fall Chinook count of 24,979 has 514 more fish than the 2015 count of 24,465 and is 1.6 times greater than the 10-year average count of 15,329. The 2016 Bonneville Dam fall Chinook jack count of 3,017 is 1.4 times greater than the 2015 count of 2,113 and has 249 more fish than the 10-year average count of 2,768. The 2016 adult fall Chinook count of 1,157 at Ice Harbor Dam in the Snake River has 607 fewer fish than the 2015 count, while have 479 more fish than the 10-year average count. The 2016 Lower Granite fall Chinook adult count of 98 has 77 fewer fish than the 2015 count and 48 more fish than the 10-year average count.

The 2016 Bonneville Dam adult steelhead count of 92,722 is about 60% of the 2015 count of 154,895 and about 45.3% of the 10-year average count of 204,667. The 2016 Bonneville Dam adult wild steelhead count of 32,504 is about 49.2% of the 2015 count of 66,054 and 41.1% of the 10-year average count of 79,002. Daily adult steelhead counts at Lower Granite Dam ranged from 948 to 2,534 adults per day last week. This year's Lower Granite steelhead count of 9,879 is about 88.8%

of the 2015 count of 11,125 and 60.1% of the 10-year average count of 16,426. The 2016 Lower Granite Dam adult wild steelhead count of 5,136 is 92.6% of the 2015 count of 5,544 and is about 79.2% of the 10-year average count of 6,483. At Willamette Falls, the 2016 count for steelhead was 25,897 as of August 17th. This year's steelhead count is about 3.7 times greater than the 2015 count of 7,001 and about 1.2 times greater than the 10-year average count of 21,948.

Daily adult sockeye passage numbers at Bonneville Dam ranged between 2 and 27 last week. The 2016 adult sockeye count at Bonneville Dam of 342,433 is about 67.1% of the 2015 count and 1.2 times greater than the 10-year average count. The 2016 adult sockeye count at McNary Dam of 261,610 is about 94% 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 806 has 398 more fish than the 2015 count of 408 and 175 fewer fish than the 10-year average count. One hundred and forty-two adult coho have crossed Bonneville Dam so far this year.

Hatchery Releases Last Two Weeks

Hatchery Release Summary

From: 8/6/2016 to 08/19/16

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

Hatchery Releases Next Two Weeks

Hatchery Release Summary

From: 8/20/2016 to 9/2/2016

Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver
Nez Perce Tribe	Dworshak NFH	CH1	SP	2017	300,000	09-01-16	09-01-16	Selway River	Clearwater River M F
Nez Perce Tribe									
Total					300,000				
Grand Total					300,000				

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
08/05/2016	105.3	0.1	104.6	0.0	108.6	8.3	113.4	9.1	118.4	20.1	114.6	19.9	109.4	27.9
08/06/2016	97.5	0.1	102.1	0.0	104.1	8.0	104.1	8.4	106.4	18.3	110.2	20.1	104.8	28.4
08/07/2016	80.4	0.1	84.0	0.0	85.0	6.2	85.3	8.4	87.5	18.0	95.7	20.3	94.9	28.8
08/08/2016	97.6	0.1	96.6	0.0	97.7	6.8	98.4	9.0	101.4	20.1	102.7	19.9	98.2	27.6
08/09/2016	91.7	0.1	91.4	0.0	93.4	6.8	95.5	8.9	97.0	20.7	108.5	19.8	106.7	27.5
08/10/2016	96.7	0.1	93.2	0.0	102.1	8.0	99.9	9.2	101.6	19.8	119.3	19.2	117.6	24.9
08/11/2016	98.6	0.1	99.2	0.0	107.0	8.5	105.6	10.0	107.5	21.1	117.6	18.2	115.5	24.4
08/12/2016	97.4	0.1	101.1	0.0	101.3	7.6	103.8	10.6	106.2	2.4	115.3	18.2	110.9	23.8
08/13/2016	89.9	0.1	88.6	0.0	95.2	6.9	95.1	8.6	98.5	0.0	109.3	17.4	108.0	22.7
08/14/2016	95.5	0.1	92.0	0.0	89.3	6.0	83.7	8.5	86.0	0.0	84.9	17.6	82.2	23.4
08/15/2016	101.8	0.1	101.3	0.0	102.1	7.7	99.0	10.0	102.4	0.0	101.2	14.1	94.0	24.6
08/16/2016	102.1	0.1	102.2	0.0	100.4	8.1	95.8	0.0	97.6	0.0	95.2	1.6	90.9	20.2
08/17/2016	99.3	0.1	102.4	0.0	101.5	7.9	99.5	0.0	100.1	0.0	98.0	1.9	92.6	4.3
08/18/2016	114.6	0.1	114.6	0.0	112.7	8.6	108.5	1.4	110.1	0.0	111.6	2.2	106.5	2.7

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	Flow	Spill
08/05/2016	9.9	0.0	---	10.0	29.1	16.4	26.1	8.8	25.3	14.1	27.5	16.6	
08/06/2016	9.9	0.0	---	9.8	26.8	14.0	26.1	8.9	24.5	12.2	28.7	17.7	
08/07/2016	9.9	0.0	---	8.5	27.5	14.9	25.2	8.9	23.8	11.7	26.5	15.7	
08/08/2016	9.9	0.0	---	9.2	25.6	16.1	24.6	8.9	23.7	11.3	27.6	16.7	
08/09/2016	10.0	0.0	---	7.7	26.2	15.8	25.1	8.9	23.0	10.7	26.6	15.8	
08/10/2016	10.0	0.0	---	8.6	25.1	15.1	24.8	9.0	22.5	10.4	25.1	14.3	
08/11/2016	10.1	0.0	---	9.1	25.1	15.1	24.5	8.9	23.6	11.2	27.1	16.1	
08/12/2016	7.8	0.0	---	8.7	25.1	10.8	24.2	8.8	23.5	11.1	26.1	15.1	
08/13/2016	7.8	0.0	---	8.7	25.0	12.1	24.3	8.8	22.7	10.5	26.1	15.1	
08/14/2016	7.8	0.0	---	8.9	22.6	9.7	22.1	8.8	21.0	8.8	23.3	12.5	
08/15/2016	10.1	0.0	---	10.4	23.6	10.6	19.5	8.9	18.9	6.8	21.3	10.5	
08/16/2016	10.1	0.0	---	11.2	29.5	16.1	27.6	7.2	26.4	12.6	28.9	18.2	
08/17/2016	10.1	0.0	---	9.9	25.8	13.1	26.3	8.8	25.5	13.4	28.2	17.2	
08/18/2016	10.2	0.0	---	11.1	26.8	14.0	24.0	13.5	22.7	10.4	24.1	12.9	

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

Date	McNary		John Day		The Dalles		Bonneville		PH1	PH2
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill		
08/05/2016	151.6	76.0	139.4	41.8	124.8	49.8	137.8	89.9	1.0	34.6
08/06/2016	137.0	68.8	128.3	38.7	116.5	46.5	133.1	89.7	1.0	30.0
08/07/2016	134.7	67.5	122.8	37.0	111.6	44.6	138.6	94.3	0.9	31.0
08/08/2016	135.2	67.7	131.9	39.7	118.3	47.4	136.8	92.4	0.9	31.1
08/09/2016	138.8	69.6	131.1	39.2	119.2	47.8	130.7	87.5	0.9	29.8
08/10/2016	142.3	71.3	134.6	40.3	122.5	48.9	131.4	88.0	0.9	30.1
08/11/2016	156.0	78.2	148.0	44.6	134.6	53.7	141.8	93.9	0.9	34.6
08/12/2016	153.9	77.1	141.6	42.5	130.7	52.3	146.4	94.3	0.9	38.7
08/13/2016	143.6	72.0	142.5	42.8	128.2	51.5	144.6	94.5	0.9	36.8
08/14/2016	127.9	64.0	118.0	35.3	107.4	43.0	125.7	81.4	0.9	31.0
08/15/2016	119.6	59.9	109.8	33.1	100.1	40.1	118.9	75.6	1.1	29.9
08/16/2016	128.0	64.1	114.9	34.6	105.1	42.0	114.2	70.7	0.9	30.1
08/17/2016	127.5	63.9	123.8	37.1	117.1	46.7	123.7	79.4	0.9	31.0
08/18/2016	134.7	67.4	126.1	37.9	113.9	45.3	127.3	83.5	0.9	30.5

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
Lower Granite Dam										
Little Goose Dam										
Lower Monumental Dam										
McNary Dam										
	08/08/16 Chinook + Steelhead	15*	0	0			0	0	0	0
Bonneville Dam										
	08/07/16 Chinook + Steelhead	16*	0	0			0	0	0	0
Rock Island Dam										

* 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>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	
8/5	117.5	117.6	117.7	24	---	---	---	0	104.5	104.7	104.9	24	102.6	103.3	103.8	24	103.9	104.3	104.6	24
8/6	111.4	117.6	117.8	24	---	---	---	0	104.5	104.7	105.1	24	102.4	102.9	103.3	24	103.8	104.1	104.4	24
8/7	104.8	105.4	106.1	24	---	---	---	0	105.1	105.3	105.7	24	102.3	103.0	103.7	24	103.5	103.8	104.1	24
8/8	104.9	105.2	106.0	19	---	---	---	0	104.6	105.0	105.9	24	102.0	102.4	103.0	24	103.2	103.4	103.5	24
8/9	104.8	105.0	105.6	20	---	---	---	0	104.3	104.6	105.4	24	101.9	102.3	102.9	24	102.9	103.1	103.3	24
8/10	103.8	104.4	104.7	22	---	---	---	0	103.7	104.0	104.8	24	102.2	102.5	103.1	24	102.7	103.0	103.3	24
8/11	102.6	103.2	103.4	24	---	---	---	0	104.0	104.2	104.5	24	102.0	102.5	103.0	24	102.3	102.5	102.7	24
8/12	103.3	103.8	104.1	24	---	---	---	0	104.0	104.2	104.4	24	101.9	102.3	102.7	24	102.5	103.0	103.3	24
8/13	103.7	104.3	104.7	24	---	---	---	0	104.4	104.7	105.1	24	102.3	102.9	103.3	24	103.3	103.8	103.9	24
8/14	104.0	104.4	104.9	24	---	---	---	0	105.3	105.4	105.5	24	102.6	103.1	103.4	24	103.7	104.0	104.3	24
8/15	104.3	104.4	104.8	15	---	---	---	0	105.3	105.5	105.7	24	102.4	102.8	103.3	24	103.5	103.7	103.9	24
8/16	104.0	104.7	105.0	23	---	---	---	0	105.2	105.4	105.7	24	102.6	103.0	103.4	24	103.7	104.1	104.5	24
8/17	104.4	104.7	105.0	24	---	---	---	0	105.2	105.4	105.5	24	102.7	103.2	103.6	24	103.6	103.8	104.1	24
8/18	104.0	104.2	104.8	23	---	---	---	0	105.2	105.3	105.5	23	102.4	102.8	103.4	23	103.1	103.4	103.7	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>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	
8/5	103.8	104.0	104.5	24	104.7	105.4	105.6	23	106.8	107.5	108.1	23	106.5	106.9	107.2	24	111.9	112.9	113.6	24
8/6	103.6	103.8	104.4	24	104.3	104.5	105.6	14	106.1	106.3	107.7	14	106.8	106.9	107.2	24	111.4	112.7	113.2	24
8/7	103.5	103.9	104.5	24	104.3	104.7	105.6	19	106.0	106.6	107.3	19	106.5	106.7	107.1	24	110.4	111.5	112.8	24
8/8	103.0	103.3	103.6	24	103.1	103.2	103.7	18	105.0	105.3	106.0	18	105.3	105.5	105.7	24	110.8	112.1	112.4	24
8/9	103.2	103.5	103.9	24	102.8	103.1	103.8	17	104.5	104.8	105.4	17	105.0	105.2	105.6	24	110.3	111.6	112.6	24
8/10	103.0	103.2	103.5	24	103.1	103.4	104.4	16	105.0	105.4	106.3	16	104.4	104.5	104.6	24	110.2	111.4	112.0	24
8/11	102.5	102.8	103.1	24	103.2	103.5	104.3	15	105.1	105.5	106.2	15	104.2	104.6	104.9	24	110.7	112.0	112.3	24
8/12	102.7	103.0	103.8	24	103.3	104.0	104.8	24	105.0	106.0	106.7	24	105.0	105.6	106.2	24	111.7	112.7	113.4	24
8/13	103.6	103.8	104.2	24	103.4	104.4	105.0	24	104.2	105.5	106.3	24	105.7	106.2	106.5	24	111.0	112.1	112.3	24
8/14	103.7	104.0	104.3	24	104.0	104.9	105.6	24	104.8	106.0	106.6	24	106.4	106.8	107.2	24	110.7	111.9	112.8	24
8/15	103.4	103.7	103.9	24	104.1	104.9	105.6	24	105.4	106.6	107.4	24	105.8	106.1	106.4	24	111.3	112.8	113.5	24
8/16	103.6	103.8	104.1	24	104.1	105.0	105.9	23	105.8	106.7	107.6	23	105.7	106.0	106.4	24	106.0	106.5	109.7	24
8/17	103.6	103.9	104.3	24	104.2	104.9	105.6	24	105.7	106.4	107.1	24	106.2	106.6	107.2	24	105.6	106.2	106.6	24
8/18	102.9	103.2	103.4	23	103.7	104.2	104.9	23	105.3	105.9	106.5	23	106.1	106.5	106.9	23	105.8	106.2	106.5	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>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	
8/5	107.3	107.9	108.4	24	111.9	112.7	113.5	24	109.0	109.7	110.9	24	111.8	112.3	113.5	24	110.6	110.9	111.1	24
8/6	107.1	107.8	108.4	24	112.1	113.1	113.8	24	106.7	107.7	108.0	24	111.0	111.7	113.6	24	110.0	110.3	110.6	24
8/7	106.9	107.2	108.1	24	112.6	113.5	114.2	24	106.3	107.2	107.6	24	111.7	112.4	113.9	24	109.8	110.0	110.1	24
8/8	106.1	106.6	107.1	24	111.7	112.6	114.5	24	105.2	105.6	106.7	24	110.6	111.1	112.3	24	109.3	109.3	109.4	24
8/9	105.9	106.2	106.7	24	111.6	112.5	113.4	23	104.3	105.9	107.0	24	110.4	111.0	111.9	24	109.1	109.3	109.4	24
8/10	105.7	106.2	106.6	24	111.0	112.0	113.8	24	106.4	107.3	107.9	24	110.0	110.4	111.1	24	109.0	109.2	109.4	24
8/11	105.5	106.1	106.6	24	110.8	111.7	112.0	24	107.0	108.1	108.7	24	109.8	110.2	111.2	24	109.1	109.3	109.6	24
8/12	106.0	106.8	108.0	24	106.7	107.6	111.5	24	108.5	109.6	110.2	24	110.6	111.2	113.4	24	109.7	109.9	110.1	24
8/13	106.9	107.5	108.0	24	106.9	107.3	108.0	24	109.0	110.1	111.1	24	110.6	110.8	111.1	24	110.4	110.7	111.0	24
8/14	107.0	107.4	107.7	24	106.7	107.1	107.5	24	107.7	108.8	110.5	24	111.1	111.8	112.6	24	110.2	110.4	110.6	24
8/15	106.7	107.3	107.8	24	106.4	107.0	107.5	24	106.6	107.7	108.9	24	109.4	111.0	112.9	24	109.4	109.5	109.8	24
8/16	106.3	106.6	107.4	24	106.1	106.5	107.2	23	105.7	107.5	108.9	24	105.9	106.6	106.9	24	109.3	109.5	109.7	24
8/17	105.0	105.6	106.1	24	104.4	105.2	105.6	24	105.9	107.1	107.9	24	105.5	106.0	106.4	24	108.0	108.3	108.7	24
8/18	105.4	105.8	106.2	23	105.0	105.4	105.7	23	---	---	---	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>Clrwrtr-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	hr		Avg	Avg		High	hr		Avg	Avg		High	hr	Avg	Avg	High
8/5	113.5	114.2	116.5	24	---	---	---	0	100.4	100.8	101.2	24	99.1	100.4	101.6	24	102.6	103.5	105.4	17
8/6	112.6	113.3	116.4	24	---	---	---	0	100.3	100.6	101.0	24	98.9	99.9	101.2	24	101.1	102.8	105.0	24
8/7	113.2	114.3	117.4	24	---	---	---	0	100.2	100.3	100.7	24	98.2	98.8	99.9	24	99.4	100.3	102.3	24
8/8	112.1	112.5	114.2	24	---	---	---	0	100.1	100.5	100.9	24	99.2	101.4	103.8	24	100.3	102.7	104.2	24
8/9	112.0	112.4	113.4	24	---	---	---	0	99.8	100.0	100.3	24	101.1	102.0	102.9	24	100.7	101.1	102.3	19
8/10	111.2	111.7	112.1	24	---	---	---	0	99.8	100.1	100.5	24	101.2	102.3	103.6	24	101.4	102.8	104.3	23
8/11	111.5	111.9	113.5	24	---	---	---	0	99.6	99.9	100.2	24	101.2	102.4	103.5	24	101.8	103.2	104.5	24
8/12	112.2	112.9	116.5	24	---	---	---	0	99.7	100.1	100.5	24	101.0	102.5	104.4	24	102.0	103.4	104.9	24
8/13	112.1	112.3	112.4	24	---	---	---	0	100.0	100.4	100.8	24	101.0	102.4	103.6	24	102.0	103.5	104.8	24
8/14	113.3	114.8	116.2	24	---	---	---	0	100.3	100.8	101.2	24	100.8	102.2	104.3	24	102.0	103.4	104.8	24
8/15	112.5	113.8	115.9	24	---	---	---	0	99.9	100.2	100.6	24	101.2	102.4	103.5	24	101.6	103.1	104.5	24
8/16	112.1	114.4	116.5	24	---	---	---	0	99.9	100.2	100.6	24	101.0	102.2	103.2	24	101.8	103.2	104.6	24
8/17	107.1	107.7	108.4	24	---	---	---	0	100.0	100.4	100.8	24	101.2	102.5	103.6	24	101.8	103.1	104.5	24
8/18	---	---	---	0	---	---	---	0	100.0	100.4	100.8	23	101.3	102.5	103.6	23	101.8	103.2	104.6	23

Total Dissolved Gas Saturation Data at Snake River Sites

Date	<u>Clrwrtr-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	hr		Avg	Avg		High	hr		Avg	Avg		High	hr	Avg	Avg	High
8/5	103.8	106.2	107.7	24	102.5	102.5	102.7	24	110.3	111.9	112.5	24	105.9	106.1	107.0	24	109.1	109.5	110.0	24
8/6	103.5	105.4	107.2	24	101.9	102.1	102.4	24	109.4	110.1	111.8	24	105.2	105.4	105.6	24	108.4	108.7	109.0	24
8/7	102.2	103.6	105.2	24	101.5	101.7	101.9	24	109.5	110.6	111.2	24	104.8	105.1	105.3	24	108.3	108.5	108.8	24
8/8	103.1	105.4	106.9	24	101.5	101.8	102.0	24	111.3	114.0	115.0	24	104.5	104.8	105.1	24	108.3	108.8	109.0	24
8/9	101.8	102.9	104.1	24	101.6	102.1	102.3	23	111.8	114.3	115.2	24	104.6	104.8	105.1	24	108.6	108.8	109.1	24
8/10	102.3	104.3	105.8	24	101.6	101.8	102.0	24	111.5	114.3	115.3	24	103.9	104.1	104.3	24	108.7	109.1	109.6	24
8/11	102.6	104.7	106.3	24	100.8	100.9	101.2	24	111.1	113.9	114.8	24	104.4	104.7	104.8	24	108.6	108.9	109.3	24
8/12	102.9	105.2	106.9	24	100.3	100.5	100.7	24	107.7	108.2	108.7	24	104.7	104.9	105.0	24	108.5	108.8	109.2	24
8/13	103.0	105.2	106.9	24	100.5	100.6	100.9	24	109.1	109.4	109.8	24	104.8	105.0	105.3	24	108.7	109.0	109.4	24
8/14	103.1	105.3	107.1	24	100.6	100.7	100.8	24	106.9	107.7	108.8	24	105.3	105.7	106.0	24	108.9	109.5	110.0	24
8/15	102.7	104.8	106.3	24	100.4	100.6	100.9	24	106.4	107.7	108.6	24	105.9	106.2	106.8	24	110.7	112.9	114.8	24
8/16	102.6	104.6	106.1	24	101.0	101.5	102.1	24	109.3	111.2	112.0	24	106.3	106.7	107.2	24	108.8	109.2	109.6	24
8/17	102.6	104.7	106.3	24	102.4	102.6	102.9	24	108.8	109.3	110.3	24	106.7	107.1	107.3	24	109.1	109.5	109.9	24
8/18	102.7	104.7	106.5	23	102.2	102.3	102.5	23	108.5	108.9	109.4	23	107.5	107.8	108.2	23	112.3	114.8	115.3	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>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	hr		Avg	Avg		High	hr		Avg	Avg		High	hr	Avg	Avg	High
8/5	106.1	106.3	106.4	24	113.1	116.2	118.6	24	110.4	110.6	110.8	24	108.5	109.6	110.7	24	---	---	---	0
8/6	105.7	105.8	106.1	24	112.1	112.5	113.7	24	109.7	109.8	110.3	24	109.3	109.8	110.8	24	---	---	---	0
8/7	105.5	105.7	106.0	24	110.9	111.5	112.0	24	109.3	109.4	109.5	24	108.3	108.8	109.2	24	---	---	---	0
8/8	105.0	105.3	105.9	24	110.3	111.1	111.5	24	108.4	108.8	109.5	24	108.7	109.6	110.5	24	---	---	---	0
8/9	104.4	104.6	104.8	24	110.3	111.4	111.8	24	107.6	107.9	108.0	24	108.4	109.0	109.4	24	---	---	---	0
8/10	104.0	104.3	104.7	24	110.8	111.2	111.8	24	107.0	107.3	107.6	24	107.9	108.4	108.7	24	---	---	---	0
8/11	103.6	103.8	104.0	24	111.0	112.0	113.2	24	105.9	106.2	106.5	24	108.2	109.7	110.7	24	---	---	---	0
8/12	103.6	103.8	104.2	24	111.2	111.6	112.0	24	105.4	105.6	105.7	24	108.1	108.7	109.3	24	---	---	---	0
8/13	104.5	105.1	105.6	24	110.5	110.8	111.1	24	105.7	106.0	106.4	24	108.0	108.7	109.3	24	---	---	---	0
8/14	105.7	106.1	106.4	24	109.7	110.2	110.9	24	106.3	106.4	106.5	24	107.2	107.7	108.3	24	---	---	---	0
8/15	105.6	105.9	106.5	24	107.8	108.1	108.5	24	107.1	107.6	108.0	22	106.5	107.0	107.6	24	---	---	---	0
8/16	105.5	105.8	106.2	24	111.0	113.2	114.7	24	107.9	108.1	108.3	24	108.7	111.0	113.4	24	---	---	---	0
8/17	105.7	106.0	106.6	24	112.1	114.0	114.4	24	108.7	108.8	109.1	24	109.0	110.4	112.4	24	---	---	---	0
8/18	105.6	106.0	106.7	23	110.0	110.4	110.8	23	108.8	108.9	109.2	23	106.4	107.0	107.9	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>#</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>					
	<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>				
8/5	106.0	106.3	107.0	24	115.5	116.1	116.6	24	104.7	105.1	105.6	24	112.9	113.3	114.0	24	108.3	109.0	109.2	24
8/6	106.4	106.8	107.3	24	114.3	114.8	115.0	24	103.4	103.7	103.9	24	112.5	113.2	113.6	24	104.7	105.1	105.4	24
8/7	107.3	107.5	107.7	24	113.7	114.0	114.2	24	103.0	103.2	103.3	24	112.1	112.5	112.6	24	103.8	104.2	104.5	24
8/8	105.5	106.0	106.6	24	114.1	114.7	115.4	24	102.5	102.7	102.8	24	112.2	112.9	113.4	24	104.2	104.7	104.9	24
8/9	104.2	104.4	104.8	24	114.2	114.6	114.9	24	102.0	102.1	102.3	24	112.6	113.2	113.9	24	104.5	105.0	105.3	24
8/10	103.4	103.6	103.8	24	114.3	115.2	115.5	24	101.8	102.1	102.4	24	112.5	113.6	114.2	24	103.8	104.1	104.2	24
8/11	104.1	104.7	104.9	24	114.8	115.6	116.0	24	102.4	102.9	103.2	24	112.9	113.6	114.1	24	105.7	106.2	106.5	24
8/12	105.7	106.4	107.6	24	115.1	115.8	116.3	24	103.5	103.7	104.4	24	112.9	113.5	113.9	24	107.1	107.5	107.8	24
8/13	107.1	107.5	108.0	24	114.9	115.8	116.5	24	104.8	105.2	106.6	24	113.3	113.6	113.8	24	107.8	108.3	108.6	24
8/14	107.9	108.3	108.7	24	114.0	114.5	115.0	24	104.4	104.9	106.0	24	112.5	112.6	112.9	24	107.2	107.7	108.1	24
8/15	107.9	108.3	108.7	24	112.9	113.7	114.7	24	104.4	105.0	105.7	24	111.9	112.1	112.3	24	105.6	105.8	106.0	24
8/16	108.9	109.4	110.4	24	113.8	115.4	116.3	23	105.1	105.9	106.4	24	112.3	112.8	113.1	24	105.4	105.8	106.0	24
8/17	108.7	108.9	109.2	24	114.8	115.5	116.3	24	106.2	106.8	107.2	24	113.5	114.1	115.9	24	106.0	106.4	106.9	24
8/18	108.2	108.5	108.8	23	115.1	116.3	117.0	23	107.3	108.0	108.5	23	114.5	115.4	116.2	23	107.1	108.1	108.6	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>#</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>					
	<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>				
8/5	113.2	113.6	113.8	24	108.6	109.0	109.4	24	115.9	116.3	116.7	24	113.1	113.7	114.2	24	115.6	117.3	117.4	24
8/6	111.3	111.7	111.9	24	105.8	106.1	107.1	24	115.8	116.1	116.3	24	111.2	112.7	113.7	24	115.3	116.7	117.2	24
8/7	110.2	110.5	110.9	24	104.5	104.7	105.1	24	115.7	116.0	116.2	24	111.8	112.5	113.2	24	116.8	116.9	117.0	24
8/8	110.6	111.3	111.4	24	104.2	104.4	104.7	24	115.5	115.8	115.9	24	112.2	113.1	113.9	24	116.7	116.8	116.8	24
8/9	110.7	111.4	112.3	24	103.9	104.0	104.3	24	114.6	114.8	115.1	24	111.6	112.4	112.7	24	114.9	116.1	116.7	24
8/10	110.7	111.5	111.9	24	104.5	105.0	105.4	24	115.2	115.5	115.7	24	112.4	113.8	114.6	24	114.2	115.1	116.8	24
8/11	111.5	112.8	113.4	24	105.8	106.7	107.6	24	116.3	116.8	117.1	24	113.9	115.4	116.4	24	116.7	116.9	117.1	24
8/12	112.7	113.5	113.9	24	108.9	109.8	110.3	24	116.8	117.4	117.9	24	114.5	115.6	116.1	24	117.1	117.3	117.4	24
8/13	113.1	113.5	113.8	24	111.0	111.9	112.3	24	117.1	117.6	118.1	24	115.1	116.1	116.9	24	117.2	117.3	117.5	24
8/14	112.3	112.6	113.0	24	110.1	110.9	111.9	24	115.9	116.4	117.0	24	113.9	114.5	115.1	24	114.6	115.3	117.1	24
8/15	111.0	111.3	111.4	24	106.8	107.3	108.3	24	115.2	115.6	115.9	24	112.0	113.0	113.6	24	114.0	114.2	114.3	24
8/16	110.7	111.0	111.4	24	104.7	104.9	105.5	24	114.5	114.7	115.2	24	111.4	112.2	112.9	24	114.1	114.4	114.6	24
8/17	111.7	112.1	112.6	24	103.6	103.8	104.2	24	114.3	114.6	114.8	24	111.2	112.3	113.0	24	114.2	114.2	114.3	24
8/18	112.0	113.0	113.7	23	104.4	105.1	105.7	23	115.7	116.4	116.8	23	112.7	114.2	115.3	23	113.9	114.0	114.1	23

Two-Week Summary of Passage Indices

Source: Fish Passage Center

Updated: 8/19/2016 10:10

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/currentsmpsubmitdata.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)
08/05/2016	*	---	---	---	0	0	0	0	0	0	---
08/06/2016	*	---	---	---	0	0	0	0	0	---	0
08/07/2016	*	---	---	---	0	0	0	0	0	---	---
08/08/2016	*	---	---	---	0	0	0	0	---	---	0
08/09/2016	*	---	---	---	0	0	0	0	0	0	---
08/10/2016	*	---	---	---	10	0	0	0	---	---	0
08/11/2016	*	---	---	---	0	0	0	0	0	---	---
08/12/2016	*	---	---	---	0	0	0	0	---	0	0
08/13/2016	*	---	---	---	0	0	0	1	0	---	---
08/14/2016	*	---	---	---	0	0	0	0	---	---	0
08/15/2016	*	---	---	---	0	0	0	0	0	---	---
08/16/2016	*	---	---	---	0	0	0	0	---	0	0
08/17/2016	*	---	---	---	0	0	0	0	0	---	---
08/18/2016	*	---	---	---	---	0	0	0	---	---	0
08/19/2016	*	---	---	---	---	---	0	---	0	0	---
<hr/>											
Total:		0	0	0	10	0	0	1	0	0	0
# Days:		0	0	0	13	14	15	14	8	5	7
Average:		0	0	0	1	0	0	0	0	0	0
YTD		27,295	56,779	16,183	7,757	5,899,058	3,490,956	4,892,141	44,784	2,181,660	1,456,048

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)
08/05/2016	*	---	---	---	1,734	534	77	16	182	10	---
08/06/2016	*	---	---	---	1,911	546	31	18	---	---	363
08/07/2016	*	---	---	---	1,436	1,042	45	10	225	---	---
08/08/2016	*	---	---	---	1,341	967	28	12	---	---	859
08/09/2016	*	---	---	---	1,738	709	27	10	114	14	---
08/10/2016	*	---	---	---	2,254	1,040	31	5	---	---	295
08/11/2016	*	---	---	---	2,333	580	27	4	124	---	---
08/12/2016	*	---	---	---	1,743	256	24	9	---	11	633
08/13/2016	*	---	---	---	796	192	51	7	83	---	---
08/14/2016	*	---	---	---	759	282	81	4	---	---	450
08/15/2016	*	---	---	---	705	205	30	4	67	---	---
08/16/2016	*	---	---	---	882	236	17	12	---	3	562
08/17/2016	*	---	---	---	630	521	35	4	50	---	---
08/18/2016	*	---	---	---	---	674	0	8	---	---	242
08/19/2016	*	---	---	---	---	---	23	---	67	3	---
<hr/>											
Total:		0	0	0	18,262	7,784	527	123	912	41	3,404
# Days:		0	0	0	13	14	15	14	8	5	7
Average:		0	0	0	1,405	556	35	9	114	8	486
YTD		0	78	698	2,869	1,173,236	874,702	327,589	20,938	4,329,084	939,655

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)
08/05/2016	*	---	---	---	---	0	0	0	0	0	---
08/06/2016	*	---	---	---	---	0	0	0	0	---	0
08/07/2016	*	---	---	---	---	0	0	0	0	0	---
08/08/2016	*	---	---	---	---	0	0	0	0	---	0
08/09/2016	*	---	---	---	---	0	0	0	0	0	---
08/10/2016	*	---	---	---	---	0	0	0	0	---	0
08/11/2016	*	---	---	---	---	0	0	0	0	---	---
08/12/2016	*	---	---	---	---	0	0	0	0	0	0
08/13/2016	*	---	---	---	---	0	0	0	0	---	---
08/14/2016	*	---	---	---	---	0	0	0	0	---	0
08/15/2016	*	---	---	---	---	0	0	0	0	---	---
08/16/2016	*	---	---	---	---	0	0	0	0	---	0
08/17/2016	*	---	---	---	---	0	0	0	0	0	---
08/18/2016	*	---	---	---	---	---	0	0	---	---	0
08/19/2016	*	---	---	---	---	---	---	0	---	0	---
<hr/>											
Total:		0	0	0	0	0	0	0	0	0	0
# Days:		0	0	0	13	14	15	14	8	5	7
Average:		0	0	0	0	0	0	0	0	0	0
YTD		0	0	0	316	198,072	147,678	60,123	45,366	154,245	58,662

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)
08/05/2016	*	---	---	---	---	0	13	0	0	0	---
08/06/2016	*	---	---	---	---	14	9	0	0	---	0
08/07/2016	*	---	---	---	---	13	16	0	0	---	---
08/08/2016	*	---	---	---	---	0	13	0	0	---	0
08/09/2016	*	---	---	---	---	0	3	0	0	0	---
08/10/2016	*	---	---	---	---	0	0	0	0	---	0
08/11/2016	*	---	---	---	---	5	0	0	0	---	---
08/12/2016	*	---	---	---	---	5	0	0	0	0	0
08/13/2016	*	---	---	---	---	4	0	0	0	---	---
08/14/2016	*	---	---	---	---	0	3	0	0	---	0
08/15/2016	*	---	---	---	---	3	0	0	0	---	---
08/16/2016	*	---	---	---	---	0	3	0	1	---	0
08/17/2016	*	---	---	---	---	0	1	2	0	---	---
08/18/2016	*	---	---	---	---	---	5	0	---	---	0
08/19/2016	*	---	---	---	---	---	---	4	---	0	---
<hr/>											
Total:		0	0	0	44	66	6	1	0	0	0
# Days:		0	0	0	13	14	15	14	8	5	7
Average:		0	0	0	3	5	0	0	0	0	0
YTD		755	26,537	3,377	9,186	3,957,212	2,295,477	1,838,095	17,663	735,188	502,821

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)
08/05/2016 *	---	---	---	---	0	0	0	0	0	0	---
08/06/2016 *	---	---	---	---	0	0	0	0	0	---	0
08/07/2016 *	---	---	---	---	0	0	0	1	0	---	---
08/08/2016 *	---	---	---	---	0	0	0	0	---	---	0
08/09/2016 *	---	---	---	---	0	0	0	0	0	0	---
08/10/2016 *	---	---	---	---	0	0	0	0	---	---	0
08/11/2016 *	---	---	---	---	0	0	0	0	0	---	---
08/12/2016 *	---	---	---	---	0	0	0	0	---	0	0
08/13/2016 *	---	---	---	---	0	0	0	0	0	---	---
08/14/2016 *	---	---	---	---	0	0	0	1	---	---	0
08/15/2016 *	---	---	---	---	0	0	0	0	0	---	---
08/16/2016 *	---	---	---	---	0	0	0	0	0	0	0
08/17/2016 *	---	---	---	---	0	0	0	0	0	---	---
08/18/2016 *	---	---	---	---	---	0	0	0	---	---	0
08/19/2016 *	---	---	---	---	---	---	0	---	0	0	---
Total:	0	0	0	0	0	0	0	2	0	0	0
# Days:	0	0	0	0	13	14	15	14	8	5	7
Average:	0	0	0	0	0	0	0	0	0	0	0
YTD	1	0	0	133	43,851	32,774	24,148	56,640	861,061	303,206	801,582

COMBINED LAMPREY JUVENILES											
Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR [†] (Samp)	LGS (Coll)	LMN (Coll)	RIS (Coll)	MCN (Coll)	JDA (Coll)	BO2 (Coll)
08/05/2016 *	---	---	---	---	0	8	0	0	12	0	---
08/06/2016 *	---	---	---	---	1	10	2	0	---	---	0
08/07/2016 *	---	---	---	---	0	12	0	0	4	---	---
08/08/2016 *	---	---	---	---	0	4	0	0	---	---	4
08/09/2016 *	---	---	---	---	1	4	0	0	8	0	---
08/10/2016 *	---	---	---	---	2	0	4	0	---	---	0
08/11/2016 *	---	---	---	---	0	2	0	0	8	---	---
08/12/2016 *	---	---	---	---	0	2	4	0	---	0	4
08/13/2016 *	---	---	---	---	0	4	0	0	8	---	---
08/14/2016 *	---	---	---	---	1	8	6	0	---	---	0
08/15/2016 *	---	---	---	---	0	2	0	0	0	---	---
08/16/2016 *	---	---	---	---	1	3	0	0	---	0	4
08/17/2016 *	---	---	---	---	0	2	0	0	4	---	---
08/18/2016 *	---	---	---	---	---	4	0	0	---	---	0
08/19/2016 *	---	---	---	---	---	---	1	---	4	0	---
Total:	0	0	0	0	6	65	17	0	48	0	12
# Days:	0	0	0	0	13	14	15	14	8	5	7
Average:	0	0	0	0	0	5	1	0	6	0	2
YTD	0	5	1	0	212	34,758	29,706	111	34,496	26,193	10,115

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 macropthalmia, 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 = $\text{Collection Counts} / \{ \text{Powerhouse Flow} / (\text{Powerhouse Flow} + \text{Spill}) \}$

LGS (Index) = Little Goose Bypass Collection System : Passage Index Counts

Passage Index = $\text{Collection Counts} / \{ \text{Powerhouse Flow} / (\text{Powerhouse Flow} + \text{Spill}) \}$

LMN (Index) = Lower Monumental Dam Bypass Collection System : Passage Index Counts

Passage Index = $\text{Collection Counts} / \{ \text{Powerhouse Flow} / (\text{Powerhouse Flow} + \text{Spill}) \}$

RIS (Index) = Rock Island Dam Second Powerhouse Bypass Trap : Passage Index Counts

Passage Index = $\text{Collection Counts} / \{ \text{Powerhouse 2 Flow} / (\text{Powerhouse 1 \& 2 Flow} + \text{Spill}) \}$

MCN (Index) = McNary Dam Bypass Collection System : Passage Index Counts

Passage Index = $\text{Collection Counts} / \{ \text{Powerhouse Flow} / (\text{Powerhouse Flow} + \text{Spill}) \}$

JDA (Index) = John Day Dam Bypass Collection System : Passage Index Counts

Passage Index = $\text{Collection Counts} / \{ \text{Powerhouse Flow} / (\text{Powerhouse Flow} + \text{Spill}) \}$

BO2 (Index) = Bonneville Dam Second Powerhouse Bypass Collection System : Passage Index Counts

Passage Index = $\text{Collection Counts} / \{ \text{Powerhouse 2 Flow} / (\text{Powerhouse 1 \& 2 Flow} + \text{Spill}) \}$

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:

8/19/16 10:09 AM

08/05/16 TO 08/19/16

		Species			
Site	Data	CH0	CH1	ST	Grand Total
LGR	Sum of NumberCollected	8,013	4	20	8,037
	Sum of NumberBarged	8,069	4	24	8,097
	Sum of NumberBypassed	0	0	0	0
	Sum of Numbertrucked	724	0	0	724
	Sum of SampleMorts	45	0	0	45
	Sum of FacilityMorts	15	0	0	15
	Sum of ResearchMorts	0	0	0	0
	Sum of TotalProjectMorts	60	0	0	60
LGS	Sum of NumberCollected	4,948		42	4,990
	Sum of NumberBarged	4,413		44	4,457
	Sum of NumberBypassed	0		0	0
	Sum of Numbertrucked	514		2	516
	Sum of SampleMorts	16		0	16
	Sum of FacilityMorts	11		1	12
	Sum of ResearchMorts	0		0	0
	Sum of TotalProjectMorts	27		1	28
LMN	Sum of NumberCollected	287		3	290
	Sum of NumberBarged	256		2	258
	Sum of NumberBypassed	0		0	0
	Sum of Numbertrucked	31		2	33
	Sum of SampleMorts	3		0	3
	Sum of FacilityMorts	1		0	1
	Sum of ResearchMorts	0		0	0
	Sum of TotalProjectMorts	4		0	4
Total Sum of NumberCollected		13,248	4	65	13,317
Total Sum of NumberBarged		12,738	4	70	12,812
Total Sum of NumberBypassed		0	0	0	0
Total Sum of Numbertrucked		1,269	0	4	1,273
Total Sum of SampleMorts		64	0	0	64
Total Sum of FacilityMorts		27	0	1	28
Total Sum of ResearchMorts		0	0	0	0
Total Sum of TotalProjectMorts		91	0	1	92

YTD Transportation Summary

Source: Fish Passage Center

Updated:

8/19/16 10:09 AM

TO: 08/19/16

		Species					
Site	Data	CH0	CH1	CO	SO	ST	Grand Total
LGR	Sum of NumberCollected	752,287	4,510,004	150,414	33,350	2,986,083	8,432,138
	Sum of NumberBarged	717,253	1,403,213	117,278	31,849	1,110,010	3,379,603
	Sum of NumberBypassed	31,770	3,104,914	33,069	650	1,875,866	5,046,269
	Sum of NumberTrucked	724	0	0	0	0	724
	Sum of SampleMorts	179	94	1	16	36	326
	Sum of FacilityMorts	2,159	1,361	66	830	103	4,519
	Sum of ResearchMorts	202	422	0	5	68	697
	Sum of TotalProjectMorts	2,540	1,877	67	851	207	5,542
LGS	Sum of NumberCollected	607,549	2,438,124	104,356	22,900	1,600,757	4,773,686
	Sum of NumberBarged	602,659	1,022,201	90,682	22,669	670,896	2,409,107
	Sum of NumberBypassed	2,872	1,415,436	13,600	7	929,747	2,361,662
	Sum of NumberTrucked	514	0	0	0	2	516
	Sum of SampleMorts	142	23	1	22	12	200
	Sum of FacilityMorts	954	464	73	202	97	1,790
	Sum of ResearchMorts	0	0	0	0	0	0
	Sum of TotalProjectMorts	1,096	487	74	224	109	1,990
LMN	Sum of NumberCollected	183,490	3,510,225	40,585	11,370	1,285,409	5,031,079
	Sum of NumberBarged	180,110	1,897,394	34,346	11,348	630,499	2,753,697
	Sum of NumberBypassed	2,568	1,612,351	6,238	0	654,785	2,275,942
	Sum of NumberTrucked	31	0	0	0	2	33
	Sum of SampleMorts	50	127	0	5	23	205
	Sum of FacilityMorts	144	353	1	18	99	615
	Sum of ResearchMorts	0	0	0	0	0	0
	Sum of TotalProjectMorts	194	480	1	23	122	820
Total Sum of NumberCollected		1,543,326	10,458,353	295,355	67,620	5,872,249	18,236,903
Total Sum of NumberBarged		1,500,022	4,322,808	242,306	65,866	2,411,405	8,542,407
Total Sum of NumberBypassed		37,210	6,132,701	52,907	657	3,460,398	9,683,873
Total Sum of NumberTrucked		1,269	0	0	0	4	1,273
Total Sum of SampleMorts		371	244	2	43	71	731
Total Sum of FacilityMorts		3,257	2,178	140	1,050	299	6,924
Total Sum of ResearchMorts		202	422	0	5	68	697
Total Sum of TotalProjectMorts		3,830	2,844	142	1,098	438	8,352

Cumulative Adult Passage at Mainstem Dams Through: 08/18

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	08/18	137215	11145	220480	13314	146704	24884	119591	10834	161735	17730	95523	21451	24979	3017	24465	2113	15329	2768
TDA	08/18	105504	9999	194116	12307	114381	21222	95764	8800	123915	15458	80170	17256	12176	1420	14506	1489	8317	1772
JDA	08/18	93659	8262	166015	11514	99110	19896	90259	7715	108768	10988	71447	16841	7856	818	9973	1012	4536	1200
MCN	08/18	82626	7237	156151	8767	89797	16347	83894	6501	96287	8723	67089	12624	4937	410	8107	550	3406	646
IHR	08/18	67484	5029	116462	5745	63912	10829	13980	1538	21408	2807	18404	4767	1157	153	1764	85	678	82
LMN	08/18	66115	6268	111511	8697	63840	10328	12460	2344	17764	4835	19733	5633	855	103	1148	145	407	77
LGS	08/18	62597	6365	105124	8553	59587	11445	12480	1919	15494	4464	18840	6201	542	38	708	53	235	29
LGR	08/18	62050	5480	104873	8379	58449	12640	12075	2107	14958	4222	16726	6692	98	6	175	16	50	8
PRD	08/16	16843	1003	27716	1570	17080	1731	80288	5126	78139	3550	55483	2565	950	154	2146	157	928	330
WAN	08/16	17164	919	25982	1077	16645	2069	79255	4110	76636	2180	52935	2019	759	118	1923	44	760	219
RIS	08/17	18646	715	31748	1092	17101	2726	79253	3434	88691	2476	55112	5343	0	0	0	0	0	0
RRH	08/17	9449	351	15244	609	7441	1202	58123	2736	74847	1876	43512	3627	0	0	0	0	0	0
WEL	08/17	11789	833	19971	1520	7481	1542	42708	2346	57064	3079	32027	3220	0	0	0	0	0	0
WFA	08/18	29294	2123	51046	2042	35288	1298	0	0	0	0	0	0	12	2	41	4	32	9

DAM	ENDDATE	Coho						Sockeye			Steelhead						Lamprey		
		2016		2015		10-Yr Avg.		2016	2015	10-Yr Avg.	2016	2015	10-Yr Avg.	Wild	Wild	10-Yr	2016	2015	10-Yr
		Adult	Jack	Adult	Jack	Adult	Jack												
BON	08/18	142	55	192	69	612	126	342433	510407	285035	92722	154895	204667	32504	66054	79002	47107	36273	20453
TDA	08/18	15	14	9	1	49	16	288262	429216	243291	29430	54844	90612	13191	28194	40018	9270	10901	5467
JDA	08/18	4	7	16	1	11	8	289826	365316	234991	16901	24642	63807	8537	13072	27168	7688	6971	4486
MCN	08/18	-2	0	18	6	1	0	261610	278268	203078	14304	20551	47901	6783	10588	19215	1184	1365	996
IHR	08/18	0	0	0	0	0	0	898	1038	840	8859	10041	26072	3702	4778	7961	725	649	211
LMN	08/18	-2	0	0	0	0	0	1016	882	983	8529	10151	26867	4239	5335	9282	198	214	62
LGS	08/18	0	0	0	0	0	0	942	572	929	8496	4589	13048	4370	2834	5323	176	109	25
LGR	08/18	1	0	0	0	0	0	806	408	981	9879	11125	16426	5136	5544	6483	88	42	7
PRD	08/16	0	1	0	0	0	0	310981	300787	238329	2411	4265	5728	0	0	0	5001	4970	2045
WAN	08/16	1	0	0	0	0	0	322359	295860	202920	2222	4004	5824	0	0	0	3129	3569	1008
RIS	08/17	0	0	0	0	0	0	310070	263134	231398	1919	3274	4372	864	1747	2234	1137	1527	384
RRH	08/17	0	0	0	0	0	0	235657	214898	196942	1412	2143	3087	578	1122	1458	964	1397	312
WEL	08/17	0	0	0	0	0	0	215613	185653	187725	1002	1385	1589	426	712	766	1	0	0
WFA	08/18	0	0	1	0	8	19	0	0	0	25897	7001	21948	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

