



Fish Passage Center

Weekly Report #18-18

July 6, 2018

This Week's Highlights

Water Supply

Precipitation throughout the Columbia Basin has varied between 0% and 121% of average at individual sub-basins over early July. Precipitation above The Dalles has been 38% of average over July. Over the 2018 water year, precipitation has ranged between 94% and 114% of average.

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

Location	Water Year 2018		Water Year 2018	
	July 1-5, 2018		October 1, 2017 to July 5, 2018	
	Observed (inches)	% Average	Observed (inches)	% Average
Columbia Above Coulee	0.24	73	32.9	102
Sneke River Above Ice Harbor	0.00	0	19.0	94
Columbia Above The Dalles	0.07	38	23.2	96
Kootenai	0.43	121	32.0	100
Clark Fork	0.02	10	27.1	114
Flathead	0.17	54	33.9	110
Pend Oreille River Basin above Waneta Dam	0.09	34	30.6	107
Salmon River Basin	0.00	0	25.4	99
Upper Snake Tributaries	0.00	2	22.7	98
Clearwater	0.01	5	41.1	112
Willamette River above Portland	0.00	3	54.2	94

Grand Coulee Reservoir is at 1285.9 feet (7-4-18) and has refilled 1.0 foot over the last week. Outflows at Grand Coulee have ranged between 95.8 Kcfs and 174.8 Kcfs over the last week.

The Libby Reservoir is currently at elevation 2443.9

feet (7-4-18) and has refilled 2.3 feet over the past week. Daily average outflows at Libby Dam have been 9.5 Kcfs over the last week.

Hungry Horse is currently at an elevation of 3559.4 feet (7-4-18) and has refilled 0.5 feet last week. Outflows at Hungry Horse have been 4.2-6.5 Kcfs over the last week.

Dworshak is currently at an elevation of 1599.7 feet (7-4-18) and has held steady last week. Dworshak outflows have been 4.2-5.2 Kcfs.

The Brownlee Reservoir was at an elevation of 2070.5 feet on July 4th, 2018 and has drafted 3.0 feet. Outflows at Hells Canyon have ranged between 9.5 and 18.8 Kcfs over the last four days.

The Biological Opinion flow period began on April 3rd in the lower Snake River (Lower Granite). According to the April Final Water Supply Forecast (April 4th, 2018), the flow objective this spring was 100 Kcfs at Lower Granite. Flows at Lower Granite Dam have averaged 111.3 Kcfs over the spring season. The summer biological flow period began on June 21st, 2018 at Lower Granite (Flow Objective = 53.3 Kcfs), flows have averaged 55.7 Kcfs over the summer period and 45.8 Kcfs last week.

Based on the April Final Water Supply Forecast, the Spring Biological Opinion Flow Objective is 260 Kcfs at McNary Dam and 135 Kcfs at Priest Rapids Dam. Flows at McNary averaged 343 Kcfs over the spring season; at Priest Rapids flows averaged 229.6 Kcfs over the spring season. The summer flow period began on July 1, 2018 at McNary Dam, with a flow objective of 200 Kcfs. Over the first several days of the summer period, flows have averaged 190.0 Kcfs at McNary.

Spill

Flows in the Lower Snake River decreased this week. Daily average flows at Lower Granite Dam ranged from 37.9 to 50.5 Kcfs this week. Flows in the Mid-Columbia and Upper Columbia rivers also decreased this week. Daily average flows at McNary and Rock Island dams ranged from 168.4 to 247.5 Kcfs and 104.3 to 182.5 Kcfs this week, respectively.

The 2018 spill for fish passage program at the lower Snake River and Mid-Columbia FCRPS projects began just after midnight on April 3rd and April 10th, respectively. Spring spill operations at these projects ran through June 15th in the Mid-Columbia and June 20th in the Snake River. According to the Fish Operations Plan, summer spill operations began at 0001 on June 16th at the Mid-Columbia River sites and 0001 on June 21st at the Snake River sites. These summer spill operations will run through August 31st at all eight FCRPS projects. A summary of summer spill operations is provided in Table 2.

Table 2. Summer spill operations at FCRPS projects.

Project	Summer Spill Level (Day/Night)
Lower Granite	18 Kcfs/18 Kcfs
Little Goose	30%/30%
Lower Monumental	17 Kcfs/17 Kcfs
Ice Harbor	Jun. 21-Jul. 13: 45 Kcfs/Gas Cap or 30%/30% Jul. 13-Aug. 31: 45 Kcfs/Gas Cap
McNary	50%/50%
John Day	Jun. 16-Jul. 20: 30%/30% or 40%/40% Jul. 20-Aug. 31: 30%/30%
The Dalles	40%/40%
Bonneville	95 Kcfs/95 Kcfs or 85 Kcfs/121 Kcfs

The summer spill operation for Lower Granite Dam is 18 Kcfs, 24-hours per day. Summer spill volumes at LGR were met or exceeded this week and there were no exceedences in total dissolved gas (TDG) waiver limits in the LGR tailrace or the Little Goose (LGS) forebay. The summer spill operation for LGS is 30%, 24-hours per day. Summer spill volumes at LGS were met this week and there were no exceedences in TDG waiver limits in the LGS tailrace or Lower Monumental (LMN) forebay. The summer spill operation for LMN is 17 Kcfs, 24-hours per day. Summer spill volumes at LMN were met this week and there were no exceedences in TDG waiver limits in the LMN tailrace or the Ice Harbor (IHR) forebay. The summer spill operation for

IHR alternates between 30% (24-hours per day) and 45 Kcfs during the day and gas cap spill at night. These two operations will alternate in two-day blocks through July 12th. On July 13th, the operation at IHR will be 45 Kcfs during the day and gas cap spill at night. Summer spill volumes at IHR were met this week. However, due to low flows, the 45 Kcfs and/or nighttime spill to the gas cap has always not been possible. Instead, spill during these periods was all flows in excess of powerhouse minimum requirements. There were no exceedences in TDG waiver limits in the IHR tailrace or the McNary (MCN) forebay this week.

Summer spill at McNary (MCN) is 50%, 24-hours per day. This summer spill operation has been met this week and there have been no exceedences of TDG waiver limits in the MCN tailrace or the John Day (JDA) forebay. The summer spill operation at JDA alternates between 30% (24-hours) and 40% (24-hours). These two “treatments” will alternate in two-day blocks. This summer spill operation at JDA has been met this week and there were no exceedences of TDG waivers in the JDA tailrace or The Dalles (TDA) forebay this week. The summer spill operation at TDA is 40%, 24-hours per day. This summer spill operation has been met this week and there were no exceedences of TDG waivers in the TDA tailrace or the Bonneville (BON) forebay this week. Finally, the summer spill operation at BON alternates between 95 Kcfs (24-hours) and 85 Kcfs during the day and 121 Kcfs at night. These two “treatments” will alternate in 2-day blocks. This summer spill operation has been met this week. The tailrace monitor at Cascades Island has been out of service since May 13th, likely as a result of high flows and spill volumes. The 12-hour average TDG at the Warrendale gauge has been in the 113-117% range this week.

Note: The State of Oregon TDG waiver only requires compliance 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.

Gas bubble trauma (GBT) monitoring in smolts took place at Little Goose, Lower Monumental, Rock Island, McNary, and Bonneville dams this week. GBT monitoring at Lower Granite did not occur this week and will likely not occur the rest of this season. Signs of fin GBT were observed in two of the eight GBT samples conducted this week (June 29-July 5). Bonneville observed zero signs of fin GBT in their samples on June 30th and July 3rd. This week's samples at Rock Island had three (July 3rd) and four (July 5th) fish with Rank 1 signs of fin GBT. McNary observed no signs of fin GBT in their samples on July 1st and July 3rd. Little Goose and Lower Monumental observed zero signs of fin GBT in their samples on July 2nd and July 4th, respectively. The action criteria for interruption of the voluntary spill for fish passage program is defined as either 15% of examined fish showing signs of GBT in their non-paired fins, or 5% of the fish examined showing severe signs of GBT in their non-paired fins. Severe signs of GBT are defined as more than 25% of the surface area of the fin is occluded by gas bubbles, which corresponds to a rank of 3 or 4. Neither of these action criteria were met this week.

Temperature

Forebay temperatures are now being reported for Lower Granite, Ice Harbor, McNary and Bonneville dams. Currently, forebay temperatures at Bonneville Dam are slight higher than the 10-year average for this time of year. The daily average temperature for July 5th at Bonneville was 66.1 °F. The current 10-year average for the Bonneville forebay at this time of year is 65.1 °F. The current forebay temperature at McNary Dam is very close to the current 10-year average. The daily average temperature for July 5th in the McNary forebay was 64.1 °F and the 10-year average for that date is 64.3 °F. The forebay temperature at Ice Harbor Dam is also very close to the current 10-year average. The daily average temperature for July 5th in the Ice Harbor forebay was 65.3 °F and the current

10-year average for that date is 64.8 °F. The forebay temperature at Lower Granite Dam is also very close to the current 10-year average. The daily average temperature for July 5th in the Lower Granite forebay was 64.9 °F and the current 10-year average for that date is 64.2 °F.

Smolt Monitoring

Smolt Monitoring Program (SMP) activities continued at all bypass facilities this week. Sampling also continued at the Imnaha River trap this week. This week's samples were dominated by subyearling Chinook at all seven SMP bypass facilities. However, subyearling Chinook passage decreased at all seven bypass facilities, when compared to last week. Passage of spring migrants (yearling Chinook, coho, sockeye, and steelhead) remained low at all bypass facilities.

This week's samples at Bonneville Dam (BON) were dominated by subyearling Chinook. This week's daily average passage index for subyearling Chinook was about 22,500 per day, which is a slight decrease from last week's daily average passage index of about 25,800 per day. Passage of spring migrants (yearling Chinook, coho, sockeye, and steelhead) remained low this week. In fact, no yearling Chinook or sockeye were encountered in this week's samples. Pacific lamprey macrophthalmia were encountered in four of this week's samples while ammocoetes were encountered only one of this week's samples.

Similar to the last two years, sampling at John Day Dam (JDA) is every-other-day. Subyearling Chinook again dominated the samples at JDA this week. This week's daily average passage index for subyearling Chinook was about 32,600 per day, which is a decrease from last week's daily average passage index of 43,800 per day. No spring migrants were encountered in this week's samples at JDA. Pacific lamprey macrophthalmia were encountered in all four of this week's samples while no ammocoetes were encountered this week. This week's daily average collection for Pacific lamprey macrophthalmia was 275 per day, which is an increase over last week's daily average collection of 150 per day.

Sampling at McNary (MCN) is also every-other-day. Subyearling Chinook dominated this week's samples at MCN. This week's daily average passage index for subyearling Chinook was about 67,000 per day, which is a large decrease from last week's daily average passage index of nearly 106,000 per day.

Passage of spring migrants remained low this week. In fact, the only spring migrants that were encountered in this week's samples were yearling Chinook, which were encountered in two of this week's three samples. Finally, Pacific lamprey macrophthalmia were also encountered in two of this week's three samples and no ammocoetes were encountered this week.

Subyearling Chinook continued to dominate the samples at Lower Granite Dam (LGR) this week. This week's daily average passage index for subyearling Chinook was about 3,500 per day, which is a decrease from last week's daily average passage index of about 7,750 per day. Passage of spring migrants remained low this week. This week's daily average passage indices for spring migrants were all less than 25 per day. Finally, no Pacific lamprey macrophthalmia were encountered this week while Pacific lamprey ammocoetes were encountered every day this week. This week's daily sample counts for Pacific ammocoetes were low, ranging from one to three per day.

Similar to recent years, sampling at Little Goose Dam (LGS) began as every-other-day but was increased to every day when transportation started on April 23rd. Subyearling Chinook continued to dominate the samples at LGS this week. This week's daily average passage index for subyearling Chinook was about 4,350 per day, which is a decrease from last week's daily average passage index of about 10,400 per day. Passage of spring migrants remained low this week. This week's daily average passage indices for spring migrants were all less than 100 per day. Finally, Pacific lamprey macrophthalmia were encountered in only one of this week's samples and ammocoetes were encountered in only two of this week's samples.

Sampling at Lower Monumental Dam (LMN) was every-third-day through April 14th, transitioned to every-other-day through April 23rd, and then transitioned to every day with the start of transportation. This week's samples at LMN were dominated by subyearling Chinook. This week's daily average passage index for subyearling Chinook was about 3,125 per day, which is a decrease from last week's daily average passage index of about 5,200 per day. Passage of spring migrants remained low this week. This week's daily average passage indices for spring migrants were all less than 50 per day. Finally, Pacific lamprey macrophthalmia were encountered in five of this week's samples and ammocoetes were encountered in

only two of this week's samples.

Subyearling Chinook continued to dominate the samples at Rock Island Dam (RIS). This week's daily average passage index for subyearling Chinook was about 300 per day, which is slightly lower than last week's daily average passage index of about 330 per day. Passage of spring migrants was very low this week. In fact, this week's daily average passage indices for spring migrants were all less than 10 per day and, for the third week in a row, no yearling Chinook were collected in this week's samples. Pacific lamprey macrophthalmia were encountered in three of this week's samples while no ammocoetes were encountered this week.

The Imnaha River Trap (IMN) is located at river kilometer 7 of the Imnaha River and is operated by the Nez Perce Tribe. Sampling at the Imnaha River Trap is year round. For 2018, the FPC currently has data from IMN for the period of February 15 through June 29th. The trap was not operated for a four-day period from June 21st through June 24th. Yearling Chinook and steelhead continue to be collected, although in relatively low numbers. The samples from June 25th through June 29th had a total of 36 yearling Chinook and 19 steelhead smolts.

Hatchery Releases

FPC has not received preliminary data from some hatcheries as of 07/06/18, therefore, this hatchery release schedule represents the most up to date accounting that are available, but should not be considered a finalized record of hatchery releases.

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. In the past week there were no scheduled releases into this zone, nor are there any scheduled for the next two.

Upper Columbia Zone:

The Upper Columbia Zone encompasses the area of the Columbia River and its tributaries from Priest Rapids Dam to Chief Joseph Dam. In the past week there were no scheduled releases into this zone, nor are there any scheduled for the next two.

Middle Columbia Zone:

The Middle Columbia Zone is defined as the Columbia River and its tributaries from Bonneville Dam to Priest Rapids Dam (excluding the Snake River). In the past week there were no new releases in this zone.

In the next two weeks, there are three scheduled releases into this zone, all occurring in the Little White Salmon River. On July 9-11th, a release of 950,000 subyearling fall Chinook will be released at the mouth of the Little White Salmon River. On the 10th, 950,000 more will be released at the Willard NFH, and another 3.86 million will be released at the Little White Salmon NFH on July 11th.

Lower Columbia Zone:

The Lower Columbia Zone is defined as the Columbia River and its tributaries below Bonneville Dam. Over the past week there were three volitional releases of fall Chinook subyearlings that concluded in this zone. Between June 1st and July 1st 830,000 juveniles were released into the Green River, a tributary of the Cowlitz. Two more releases finished up on the 1st as well, comprising 3.5 million subyearling fall Chinook at Fallert Creek Hatchery, and another 3.5 million at Kalama Falls Hatchery. Over the next two weeks there are no more scheduled releases into this zone.

Adult Passage

The summer Chinook count began June 1st at Bonneville Dam. Daily passage numbers at Bonneville Dam ranged between 831 and 1,086 adult summer Chinook in the last week. The 2018 summer Chinook count of 48,954 is about 71.3% of the 2017 count and 62.6% of the 10-year average. The 2018 summer Chinook jack count of 3,066 is about 37.2% of the 2017 count and 18.5% of the 10-year average count. At Willamette Falls, 22,405 adult spring Chinook have been counted so far this year. In 2017, 30,539 adult spring Chinook were counted at Willamette Falls. This year's count is about 73.4% of the 2017 count and 68.8% of the 10-year average count of 32,567. As of July 2nd, a total of 28,149 adult summer Chinook have been counted at McNary Dam and 5,613 have been counted at Lower Granite Dam. The 2018 McNary Dam adult summer Chinook count is about 82% of the 2017 count and 66.8% the 10-year average count. The 2018 Lower Granite Dam adult summer Chinook count has 290 fewer fish than the 2017 count and 6,685 fewer fish

than the 10-year average count.

The 2018 Bonneville Dam adult steelhead count of 9,988 is about 1.7 times greater than the 2017 count of 5,847, while being 51.3% of the 10-year average count of 19,439. The 2018 Bonneville Dam adult unclipped steelhead count of 4,506 has 2,382 more fish than the 2017 count of 2,124 and 2,996 fewer fish than the 10-year average count of 7,502. This year's Lower Granite steelhead count of 4,701 is about 64.1% of the 2017 count of 7,333 and 51.9% of the 10-year average count of 9,058. The 2018 Lower Granite Dam adult unclipped steelhead count of 1,344 has 1,725 fewer fish than the 2017 count of 3,069 and has 2,418 fewer fish than the 10-year average count of 3,762. At Willamette Falls, the 2018 count for steelhead was 8,987 as of July 1st. This year's steelhead count is about 3.8 times greater than the 2017 count of 2,335, while being about 49.2% of the 10-year average count of 18,253.

Daily adult sockeye passage numbers at Bonneville Dam ranged between 3,953 and 7,043 last week. The 2018 adult sockeye count at Bonneville Dam of 168,607 is about 2.2 times greater than the 2017 count, while being about 61.9% of the 10-year average count. A total of 25,739 lampreys have been counted at Bonneville Dam so far this year. The Bonneville 2018 lamprey count is about 58% of the 2017 count of 44,396, while being about 2.2 times greater than the 10-year average count of 11,952.

Hatchery Releases Last Two Weeks

Hatchery Release Summary

	From:	6/23/2018		to	07/06/18					
Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver	Zone
Washington Dept. of Fish and Wildlife	Fallert Creek Hatchery	CH0	FA	2018	3,500,000	05-01-18	07-01-18	Fallert Creek Hatchery	Kalama River	LCOL
Washington Dept. of Fish and Wildlife	Kalama Falls Hatchery	CH0	FA	2018	3,500,000	05-01-18	07-01-18	Kalama Falls Hatchery	Kalama River	LCOL
Washington Dept. of Fish and Wildlife	North Toutle Hatchery	CH0	FA	2018	830,000	06-01-18	07-01-18	Green River	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife Total					7,830,000					
Grand Total					7,830,000					

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

Hatchery Releases Next Two Weeks

Hatchery Release Summary

	From:	7/7/2018		to	7/20/2018					
Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver	Zone
U.S. Fish and Wildlife Service	Little White Salmon NFH	CH0	FA	2018	3,860,000	07-11-18	07-11-18	Little White Salmon River	Little White Salmon River	MCOL
U.S. Fish and Wildlife Service	Willard Hatchery	CH0	FA	2018	950,000	07-09-18	07-11-18	Little White Salmon River	Little White Salmon River	MCOL
U.S. Fish and Wildlife Service	Willard Hatchery	CH0	FA	2018	950,000	07-10-18	07-10-18	Willard Hatchery	Little White Salmon River	MCOL
U.S. Fish and Wildlife Service Total					5,760,000					
Grand Total					5,760,000					

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
06/22/2018	142.7	0.1	139.9	0.0	146.9	16.9	149.9	14.5	158.7	30.5	167.0	37.5	163.0	30.0
06/23/2018	139.7	0.2	139.7	0.0	148.3	14.9	142.8	12.3	155.0	26.6	155.5	31.9	150.1	21.3
06/24/2018	161.8	0.1	155.8	0.0	165.6	23.1	163.5	13.9	172.2	26.5	177.4	39.8	173.2	48.5
06/25/2018	150.6	0.1	154.9	0.0	164.7	26.2	167.7	20.1	176.5	32.8	185.7	60.4	182.8	63.4
06/26/2018	172.3	0.1	169.2	12.6	178.4	50.8	179.2	28.8	188.0	34.3	196.7	69.0	194.1	63.7
06/27/2018	180.5	0.1	184.0	24.4	192.1	48.1	197.3	47.9	201.8	44.0	207.1	81.9	206.5	87.5
06/28/2018	174.8	0.1	175.3	19.1	186.5	41.5	190.7	38.4	195.1	43.3	209.8	91.2	209.1	74.4
06/29/2018	165.6	0.1	164.9	0.0	176.5	36.7	177.0	26.7	182.5	35.3	185.7	52.4	183.9	66.7
06/30/2018	142.9	0.1	146.8	0.0	160.7	21.3	159.5	16.5	167.8	31.0	176.5	52.5	176.3	56.1
07/01/2018	128.3	0.1	128.6	0.0	133.9	20.3	131.4	12.2	139.7	26.3	146.4	20.2	143.3	22.8
07/02/2018	119.0	0.1	105.7	0.0	121.4	9.8	123.1	13.2	132.9	26.7	155.4	26.9	152.6	18.2
07/03/2018	111.4	0.1	113.1	0.0	116.6	9.8	114.7	11.5	122.3	23.6	122.1	18.8	120.3	12.1
07/04/2018	95.8	0.2	91.7	0.0	96.0	10.0	99.2	9.2	104.3	22.7	114.0	18.8	111.3	19.6
07/05/2018	91.7	0.1	96.0	0.0	103.9	10.0	106.3	9.1	115.2	22.8	122.0	18.7	117.5	19.7

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

Date	Dworshak		Brownlee Inflow	Hells Canyon	Lower Granite		Little Goose		Lower Monumental		Ice Harbor	
	Flow	Spill		Outflow	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
06/22/2018	4.3	0.0	---	---	67.2	19.1	67.2	20.1	65.6	16.9	67.5	20.3
06/23/2018	5.9	1.6	---	---	72.2	19.2	71.4	21.4	71.3	16.6	74.3	39.4
06/24/2018	6.0	1.7	---	---	68.3	19.2	68.5	20.6	67.4	17.0	71.6	50.5
06/25/2018	4.9	0.6	---	---	63.3	18.8	62.9	18.9	62.0	16.5	63.7	30.4
06/26/2018	4.0	0.0	---	---	60.9	18.9	61.3	18.4	60.0	16.8	63.4	18.9
06/27/2018	4.5	0.3	---	---	60.6	18.8	60.1	18.1	59.2	16.5	60.7	35.6
06/28/2018	5.0	0.7	---	---	57.4	19.1	57.3	27.0	57.1	17.1	60.8	48.2
06/29/2018	5.3	1.0	---	---	50.5	18.9	48.9	14.8	48.2	16.5	50.9	22.3
06/30/2018	4.9	0.6	---	---	46.0	17.5	42.8	12.8	41.5	17.0	42.2	12.6
07/01/2018	4.8	0.6	---	---	43.7	17.5	41.4	12.3	42.5	16.7	44.7	26.9
07/02/2018	4.9	0.6	---	---	39.7	17.5	39.6	12.0	40.6	17.0	43.1	33.4
07/03/2018	5.4	0.4	---	---	41.1	17.6	42.3	12.7	41.4	16.7	43.4	18.8
07/04/2018	5.3	0.0	---	---	42.0	17.5	41.4	12.5	42.7	17.1	44.9	13.4
07/05/2018	5.3	0.0	---	---	37.9	17.6	37.1	11.1	37.6	16.7	39.6	24.9

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

Date	McNary		John Day		The Dalles		Bonneville			
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	PH1	PH2
06/22/2018	218.0	109.1	205.2	79.2	194.3	77.4	211.6	90.5	2.2	106.6
06/23/2018	240.0	120.2	233.3	70.4	216.6	86.3	236.5	95.7	8.1	120.2
06/24/2018	249.8	125.2	254.2	79.9	236.6	92.7	246.6	100.5	19.7	113.9
06/25/2018	259.0	129.8	246.5	98.3	228.9	90.3	246.5	95.0	42.9	96.1
06/26/2018	255.2	127.8	260.7	101.1	242.6	96.7	263.1	91.3	64.0	95.4
06/27/2018	275.0	165.2	266.6	110.0	248.1	98.4	264.3	96.0	64.7	91.2
06/28/2018	268.1	134.0	253.9	79.6	236.0	94.5	253.7	100.5	50.9	89.9
06/29/2018	247.5	123.8	253.2	101.3	236.4	94.6	253.8	95.7	51.5	94.1
06/30/2018	243.2	121.7	228.0	88.4	213.2	85.6	243.5	90.3	37.1	103.7
07/01/2018	205.3	102.7	200.9	60.4	187.7	75.2	214.6	94.8	8.3	99.1
07/02/2018	189.4	94.7	178.3	55.6	159.7	63.6	175.7	100.3	0.0	63.0
07/03/2018	194.3	97.2	196.4	78.6	183.5	73.3	202.4	95.4	0.0	94.6
07/04/2018	170.8	85.6	158.8	62.1	147.7	59.0	170.7	89.8	0.0	68.4
07/05/2018	168.4	84.5	158.3	47.7	141.9	57.0	148.7	91.4	---	---

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										
	06/25/18 Chinook + Steelhead	95*	1	1			1	0	0	0
	07/02/18 Chinook + Steelhead	80*	0	0			0	0	0	0
Lower Monumental Dam										
	06/27/18 Chinook + Steelhead	83*	0	0			0	0	0	0
	07/04/18 Chinook + Steelhead	75*	0	0			0	0	0	0
McNary Dam										
	06/23/18 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	06/25/18 Chinook + Steelhead	100	1	0	0.00%	0.00%	0	0	0	0
	07/01/18 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	07/03/18 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
Bonneville Dam										
	06/23/18 Chinook + Steelhead	60*	0	0			0	0	0	0
	06/26/18 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	06/30/18 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	07/03/18 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
Rock Island Dam										
	06/26/18 Chinook + Steelhead	11*	0	0			0	0	0	0
	06/28/18 Chinook + Steelhead	100	5	5	5.00%	1.00%	3	1	1	0
	07/03/18 Chinook + Steelhead	100	3	3	3.00%	0.00%	3	0	0	0
	07/05/18 Chinook + Steelhead	100	4	4	4.00%	0.00%	4	0	0	0

Samples marked with an asterisk indicate the sample size criteria of 100 fish was not met due to insufficient numbers of fish to sample that day. The inability to collect an adequate sample precludes the accurate estimation of the percentage of fish with GBT, and no estimate is provided.

The action criteria for interruption of the voluntary spill for fish program is defined as either 15% of examined fish showing signs of gas bubble trauma in their non-paired fins, or 5% of the fish examined showing severe signs of gas bubble trauma in their non-paired fins where severe signs constitute >25% of the surface area of the fin is occluded by gas bubbles, corresponding to ranks of 3 or 4.

**Total Dissolved Gas Saturation(%) - Average of
12 Highest Hours, 24 Hours Average and 24 Hours High
(Washington Calculation)**

Total Dissolved Gas Data at Upper Columbia Sites

Date	Hungry H. Dnst				Boundary				Grand Coulee				Grand C. Tlwr				Chief Joseph				Chief J. Dnst				Date
	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	
06/22									117.9	118.5	119.2	24	117.9	118.0	118.7	24	117.8	118.3	118.3	24	116.9	117.4	117.7	24	06/22
06/23									118.5	118.7	118.9	24	117.6	117.9	118.2	24	117.2	117.8	117.7	24	116.2	116.9	117.0	24	06/23
06/24									118.5	118.8	119.3	24	117.2	117.6	117.8	24	117.0	117.3	117.7	24	116.3	116.6	117.2	24	06/24
06/25									118.7	118.9	119.2	17	117.7	117.8	118.4	17	117.0	117.6	118.1	24	116.3	116.9	117.5	24	06/25
06/26									117.7	118.8	117.9	16	116.7	117.8	117.0	16	115.4	116.3	115.7	24	113.4	115.6	115.0	24	06/26
06/27									118.0	118.1	118.4	24	116.4	116.7	116.8	24	115.9	116.4	116.6	24	113.2	113.4	113.7	24	06/27
06/28									117.9	118.2	118.4	24	116.4	116.7	116.9	24	116.2	116.6	116.7	24	113.5	113.8	114.5	24	06/28
06/29									117.0	117.5	117.4	24	115.5	116.2	116.1	24	115.1	115.9	115.4	24	114.2	114.3	114.5	24	06/29
06/30									115.8	117.0	116.5	24	114.6	115.5	115.1	24	114.5	115.2	114.8	24	113.9	114.1	114.2	24	06/30
07/01									114.7	115.6	115.3	24	114.7	115.1	115.9	24	114.3	114.7	115.1	24	113.7	114.1	114.5	24	07/01
07/02									113.5	114.4	113.9	24	114.0	114.4	115.2	24	113.5	114.3	114.0	24	112.9	113.7	113.6	24	07/02
07/03									112.9	113.6	113.5	24	113.0	113.6	114.4	24	113.4	113.8	114.3	24	112.6	113.2	113.6	24	07/03
07/04									109.9	112.5	111.7	24	113.1	114.1	115.3	24	112.5	113.6	113.3	24	112.1	112.8	112.9	24	07/04
07/05									109.3	109.6	110.6	23	112.8	113.8	116.3	23	113.5	113.9	114.4	23	112.7	112.9	113.1	23	07/05

Total Dissolved Gas Data at Upper Columbia Sites

Date	Wells				Wells Dwnstrm				Rocky Reach				Rocky R. Tlwr				Rock Island				Rock I. Tlwr				Date
	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	
06/22	116.1	116.4	116.7	24	117.7	118.8	122.4	24	116.2	117.4	117.0	24	117.5	118.1	118.4	24	114.3	115.8	115.0	24	116.5	117.7	117.4	23	06/22
06/23	115.6	116.0	116.4	24	117.0	118.5	118.6	24	115.0	116.1	115.6	24	116.7	117.5	117.3	22	113.6	114.5	114.5	22	115.8	116.5	116.5	20	06/23
06/24	116.1	116.4	117.4	24	118.4	119.7	122.1	24	116.3	116.7	117.0	24	117.6	118.1	119.0	24	114.6	115.8	116.1	24	116.4	117.4	117.9	24	06/24
06/25	115.1	116.6	117.5	23	117.8	120.2	121.5	23	116.3	116.9	117.3	24	118.3	119.4	122.6	23	114.9	115.8	115.9	24	116.8	117.8	119.0	21	06/25
06/26	113.7	114.1	114.5	24	120.2	121.7	126.3	24	115.4	116.0	116.4	24	118.8	120.5	122.8	22	115.1	116.3	117.0	24	117.6	120.1	120.9	20	06/26
06/27	113.8	114.2	114.4	10	105.8	120.4	122.0	23	118.7	120.2	121.5	24	123.0	124.5	125.1	22	117.3	119.9	120.6	23	121.4	122.9	123.7	21	06/27
06/28	113.9	114.0	114.3	18	112.4	118.8	119.8	24	118.6	119.6	120.3	24	122.3	123.8	125.8	24	117.6	119.9	119.9	24	122.0	123.1	124.5	23	06/28
06/29	113.3	114.0	113.8	24	117.7	118.9	120.5	24	116.8	117.8	117.4	24	119.3	120.9	124.4	21	116.6	117.4	120.3	23	120.6	121.6	123.5	20	06/29
06/30	112.8	113.6	113.7	24	115.4	117.0	121.1	24	116.4	117.0	117.5	24	118.4	119.4	122.4	22	115.7	117.1	118.5	23	118.8	121.2	120.9	21	06/30
07/01	112.8	113.2	113.7	24	115.9	118.0	127.8	24	114.8	116.0	116.0	24	116.7	117.8	117.9	22	114.0	117.0	115.2	24	117.9	120.0	119.3	22	07/01
07/02	112.0	112.5	113.0	21	111.0	117.7	113.8	24	111.9	114.7	113.0	24	115.3	116.8	116.3	24	111.9	113.9	114.1	24	116.5	117.9	118.1	23	07/02
07/03	111.8	112.3	112.7	24	113.3	113.6	114.1	24	113.4	114.0	114.5	24	115.4	115.9	116.7	21	112.3	113.7	114.2	23	115.7	117.1	117.6	19	07/03
07/04	112.5	113.2	113.5	24	114.0	115.0	117.3	24	111.8	112.8	112.0	23	113.3	115.8	114.7	20	111.8	113.7	113.1	21	115.8	117.1	117.0	17	07/04
07/05	113.0	113.6	114.1	23	114.5	115.0	115.7	23	112.9	113.6	114.2	23	114.2	115.3	116.2	21	111.5	112.5	113.4	22	115.4	116.0	116.6	20	07/05

FISH PASSAGE CENTER

**Total Dissolved Gas Saturation(%) - Average of
12 Highest Hours, 24 Hours Average and 24 Hours High
(Washington Calculation)**

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Total Dissolved Gas Data at Upper and Mid-Columbia Sites

Date	Wanapum				Wanapum Tlwr				Priest Rapids				Priest R. Dnstr				Pasco				Date
	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	
06/22	114.3	116.6	115.2	24	114.1	115.7	114.9	24	112.5	114.0	113.6	24	112.5	113.2	112.9	24					06/22
06/23	112.7	114.2	114.8	24	112.9	114.2	114.0	24	110.7	112.1	111.8	24	110.9	112.3	111.9	24					06/23
06/24	114.9	116.7	117.7	24	114.2	114.4	119.7	24	112.4	113.9	114.4	24	113.2	114.2	115.1	24					06/24
06/25	113.2	116.8	116.6	24	117.4	118.3	125.4	24	113.1	114.1	114.3	24	114.8	115.9	116.9	24					06/25
06/26	112.7	113.7	114.4	24	117.3	123.0	124.0	24	114.7	117.1	119.3	24	115.6	117.0	117.9	24					06/26
06/27	115.0	115.9	116.9	24	119.7	120.3	125.3	24	115.7	116.8	117.6	24	117.7	118.6	118.9	24					06/27
06/28	114.9	115.9	115.7	24	122.0	122.8	125.8	24	116.2	117.6	118.3	24	117.9	118.6	119.0	24					06/28
06/29	113.7	114.3	114.3	24	115.7	121.5	125.3	24	115.6	117.4	116.8	24	116.4	118.3	117.4	24					06/29
06/30	114.3	114.5	114.7	24	117.1	120.1	129.3	24	114.0	116.3	120.7	24	115.1	116.4	116.8	24					06/30
07/01	112.7	114.3	113.7	24	113.1	114.0	113.8	24	112.6	117.7	120.3	24	112.9	116.4	116.6	24					07/01
07/02	110.6	112.1	111.5	24	111.6	112.8	113.3	24	109.5	111.3	110.8	24	110.7	111.8	111.3	24					07/02
07/03	112.4	113.8	114.7	24	112.0	112.5	113.4	24	108.0	108.9	110.0	24	109.1	110.7	110.6	24					07/03
07/04	113.6	114.3	115.3	24	113.4	113.9	114.9	24	111.0	111.5	111.9	24	111.3	111.6	111.8	24					07/04
07/05	114.4	115.5	117.1	24	113.4	113.9	114.5	24	112.6	113.1	114.0	24	112.1	112.8	113.0	24					07/05

Total Dissolved Gas Data at Snake and Clearwater Sites

Date	Dworshak				Clrwr Peck				Anatone				Clrwr-Lewiston				Lower Granite				Lower G. Tlwr				Date
	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	
06/22	101.5	102.2	102.7	24	101.6	102.4	102.9	24	103.8	104.6	105.2	24	102.7	104.2	105.3	24	103.1	103.3	103.8	24	113.4	113.7	114.1	24	06/22
06/23	105.2	105.5	106.1	24	102.1	102.7	103.3	24	103.5	104.4	104.6	24	102.7	104.4	105.7	24	102.9	103.5	103.8	24	113.6	113.8	114.6	24	06/23
06/24	106.1	106.5	106.9	24	102.5	103.5	104.2	24	103.9	104.9	105.5	24	103.7	105.7	107.0	24	102.3	102.8	103.3	24	113.9	114.0	114.9	24	06/24
06/25	103.6	106.4	106.2	24	100.8	103.5	102.5	24	103.4	104.8	104.1	24	103.4	105.4	106.0	24	102.0	103.0	103.2	24	113.7	114.2	114.6	24	06/25
06/26	101.1	101.8	102.2	24	99.1	100.3	100.7	24	103.2	104.1	104.8	24	102.5	104.4	105.8	24	100.9	101.6	101.3	24	113.5	114.0	115.1	24	06/26
06/27	103.1	105.0	106.7	24	99.1	100.6	101.7	24	103.6	104.5	105.1	23	103.1	105.2	106.7	24	101.8	102.1	102.3	24	113.8	114.3	115.6	24	06/27
06/28	102.9	104.7	104.9	24	98.1	100.6	99.2	24	103.0	104.2	104.1	24	102.6	104.7	105.2	24	101.8	102.2	102.7	24	113.6	113.9	114.3	24	06/28
06/29	103.4	103.8	104.6	24	97.2	98.7	98.1	24	102.6	103.3	104.0	24	102.7	104.5	106.0	24	101.2	101.5	101.7	24	115.1	115.3	116.3	24	06/29
06/30	102.3	103.7	103.6	24	95.3	97.6	97.0	24	102.8	103.8	104.7	24	103.2	105.3	107.0	24	101.0	101.4	101.4	24	114.7	115.1	115.3	24	06/30
07/01	102.3	103.3	104.0	24	93.3	94.5	94.7	24	102.8	103.7	104.6	24	103.2	105.1	106.7	24	100.4	101.2	100.8	24	114.7	115.0	115.7	24	07/01
07/02	102.3	103.3	104.6	24	100.1	103.1	103.6	18	102.5	103.4	104.2	24	102.6	104.7	105.2	24	100.2	100.5	101.0	24	114.6	114.9	115.0	24	07/02
07/03	102.0	103.5	104.8	24	102.0	102.9	103.2	24	102.2	103.1	103.8	24	102.6	104.6	105.7	24	100.3	100.8	100.9	24	114.8	115.0	115.5	24	07/03
07/04	101.0	101.5	102.1	24	101.9	103.0	103.8	24	102.6	103.6	104.4	24	103.0	105.1	106.5	24	101.6	102.3	104.0	24	115.0	115.4	116.8	24	07/04
07/05	101.4	102.0	102.6	23	102.6	103.8	104.8	23	103.1	104.2	105.2	23	103.9	106.5	108.4	23	100.9	102.4	101.8	23	115.3	115.6	116.2	23	07/05

FISH PASSAGE CENTER

**Total Dissolved Gas Saturation(%) - Average of
12 Highest Hours, 24 Hours Average and 24 Hours High
(Washington Calculation)**

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Total Dissolved Gas Data at Lower Snake Sites

Date	Little Goose				L. Goose Tlwr				Lower Mon.				Lwr. Mon. Tlwr				Ice Harbor				Tlwr Ice Harbor				Date
	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	
06/22	116.6	117.2	117.2	24	112.9	113.2	113.6	24	117.0	117.9	117.6	24	118.7	118.9	119.2	24	115.6	116.6	116.1	24	115.6	116.1	116.7	24	06/22
06/23	115.2	116.5	116.3	24	113.0	113.3	113.6	24	113.7	116.6	115.2	24	117.5	118.8	118.5	24	114.4	115.4	114.8	24	114.9	116.1	116.4	24	06/23
06/24	114.0	115.0	114.6	24	112.2	112.5	112.6	24	112.7	113.1	113.6	24	117.3	117.7	118.3	24	114.7	115.0	115.7	24	116.0	116.1	116.5	24	06/24
06/25	112.0	114.2	114.0	19	111.6	112.3	111.9	19	113.2	113.6	114.1	19	117.0	117.8	118.3	19	114.6	115.5	116.1	19	115.3	115.9	116.3	19	06/25
06/26	110.1	111.1	110.7	24	111.4	111.5	111.6	24	112.3	112.9	112.6	24	117.3	117.8	118.1	24	112.8	113.8	113.3	24	113.4	115.0	115.2	24	06/26
06/27	110.5	111.0	111.3	24	111.7	111.9	112.1	24	111.6	112.2	112.0	24	116.6	117.6	117.9	24	113.1	113.4	113.6	24	113.9	115.3	115.8	23	06/27
06/28	110.4	111.0	114.5	23	114.2	116.6	118.5	23	111.3	111.8	112.0	19	116.3	116.8	117.3	19	113.4	113.6	113.9	24	115.2	115.8	116.2	24	06/28
06/29	109.1	110.3	110.5	24	111.6	114.2	111.9	24	111.2	111.8	111.7	24	115.8	116.5	116.6	24	112.7	113.5	113.1	24	112.5	114.8	115.3	24	06/29
06/30	109.1	109.6	109.6	24	111.8	112.1	112.2	24	110.1	111.0	110.8	24	116.0	116.2	116.7	24	111.7	112.8	112.3	24	111.5	111.9	112.2	24	06/30
07/01	108.9	109.2	109.4	24	112.1	112.3	112.5	24	110.9	111.3	112.2	24	116.3	116.5	116.9	24	111.6	111.8	112.0	24	112.7	113.7	114.2	24	07/01
07/02	108.0	109.0	108.4	24	112.1	112.3	112.4	24	109.8	110.8	110.4	24	116.2	116.4	116.8	24	111.7	111.9	112.0	24	112.8	113.7	113.7	24	07/02
07/03	107.7	108.2	108.4	24	112.2	112.3	112.4	24	108.9	109.5	109.5	24	115.8	116.3	116.7	24	110.6	111.7	111.1	24	111.7	112.4	113.3	24	07/03
07/04	107.7	108.1	108.3	24	112.5	112.8	112.9	24	109.2	109.5	109.8	24	115.7	116.1	116.7	24	111.3	111.8	112.2	24	111.1	111.5	112.1	24	07/04
07/05	108.1	108.2	108.4	23	112.7	112.8	113.1	23	109.4	109.6	109.9	23	115.9	116.3	116.8	23	111.1	111.8	111.5	23	112.0	113.1	114.0	23	07/05

Total Dissolved Gas Data at Mid-Columbia Sites

Date	McNary-Wash.				Tlwr McNary				John Day				Tlwr John Day				The Dalles				Dnstr T. Dalles				Date
	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	
06/22	111.9	113.3	113.2	24	118.0	119.0	119.4	24	110.2	111.9	110.6	24	113.6	116.1	115.6	24	109.1	110.5	110.0	24	114.3	115.5	114.9	24	06/22
06/23	109.3	110.7	110.0	24	118.9	119.8	120.1	24	109.3	110.1	109.8	24	113.5	114.6	114.8	24	108.5	108.9	109.1	24	114.2	115.1	115.6	24	06/23
06/24	110.6	111.1	112.5	24	119.6	120.5	120.9	24	109.3	110.1	110.7	24	114.2	115.1	117.1	24	110.8	112.2	112.8	24	115.8	116.8	117.7	24	06/24
06/25	110.0	111.6	112.8	19	118.9	120.5	119.9	23	108.2	110.1	110.2	17	115.7	117.1	117.8	24	109.3	112.3	111.7	17	114.7	116.9	116.5	17	06/25
06/26	109.0	109.3	109.8	24	117.6	118.5	118.9	24	107.3	107.7	108.1	18	116.9	117.9	118.2	24	110.0	110.6	111.2	18	115.4	115.7	116.1	18	06/26
06/27	111.0	111.8	112.5	24	119.1	120.2	120.5	24	109.4	110.3	110.5	24	116.3	118.1	118.4	24	110.1	111.0	111.4	24	115.4	115.9	116.3	24	06/27
06/28	111.6	112.0	112.3	24	117.7	119.5	118.6	24	108.6	110.4	110.1	24	114.1	117.0	117.3	24	108.7	110.1	110.7	24	114.4	114.9	115.2	24	06/28
06/29	111.5	112.1	112.2	24	117.5	117.9	118.7	24	107.1	108.0	107.6	24	116.5	117.3	117.5	24	108.2	109.6	110.4	24	114.1	114.9	115.4	24	06/29
06/30	111.7	112.0	112.2	24	117.3	117.7	118.1	24	107.1	107.4	107.7	24	115.0	116.7	116.5	24	109.2	109.8	109.6	24	114.5	115.0	115.5	24	06/30
07/01	111.2	111.7	111.9	24	116.6	117.2	117.1	24	106.6	107.3	107.2	24	113.7	115.4	114.2	24	108.0	109.2	108.8	24	113.9	114.7	114.7	24	07/01
07/02	110.1	111.2	111.3	23	116.4	116.6	117.1	23	105.5	106.8	106.5	24	113.6	113.9	114.2	24	105.7	107.5	106.4	24	112.1	113.3	112.5	24	07/02
07/03	109.4	109.8	110.0	24	116.0	117.0	117.5	24	105.3	106.0	107.4	24	114.8	116.0	117.2	24	106.6	107.9	110.0	24	113.2	114.2	114.6	24	07/03
07/04	110.0	110.6	112.0	24	115.3	116.3	116.8	24	106.8	106.9	107.3	24	113.6	115.0	115.1	24	111.0	111.3	111.7	24	115.2	116.2	116.8	24	07/04
07/05	108.1	109.2	109.3	23	115.5	116.0	116.5	23	106.3	106.8	106.8	23	113.8	114.2	114.5	23	110.2	110.9	110.8	23	114.5	115.8	115.8	23	07/05

FISH PASSAGE CENTER

**Total Dissolved Gas Saturation(%) - Average of
12 Highest Hours, 24 Hours Average and 24 Hours High
(Washington Calculation)**

[INTERNAL PURPOSES ONLY]

Date 7/6/2018 7:15:10 AM

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Total Dissolved Gas Data at Mid-Columbia Sites

Date	Bonneville				Warrendale				CamasWashug.				Cascade Isld.				Date
	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	
06/22	109.6	112.3	110.9	24	113.7	115.7	114.8	24	112.8	115.0	114.1	24					06/22
06/23	108.4	109.2	109.3	24	113.6	114.3	115.4	24	111.2	113.1	113.7	24					06/23
06/24	111.5	112.8	113.7	24	115.7	116.2	116.7	24	112.6	114.9	116.6	24					06/24
06/25	111.8	113.2	113.3	17	114.5	115.5	115.3	17	111.0	114.9	112.3	17					06/25
06/26	110.3	111.1	111.2	18	113.1	115.2	113.6	18	112.3	113.0	114.0	18					06/26
06/27	111.5	111.8	112.1	24	113.8	114.3	115.6	24	111.8	113.1	114.7	24					06/27
06/28	109.2	111.4	110.6	24	113.5	113.9	114.8	24	111.1	112.7	113.6	24					06/28
06/29	109.1	110.0	110.2	24	113.1	113.7	114.0	24	111.2	112.7	112.6	24					06/29
06/30	109.9	110.0	110.2	24	113.1	113.7	113.7	24	111.3	112.3	113.1	24					06/30
07/01	109.4	109.9	109.9	24	113.8	114.3	115.1	24	111.3	112.4	113.8	24					07/01
07/02	107.4	109.2	108.6	24	111.5	113.3	114.2	24	110.0	112.2	113.3	24					07/02
07/03	107.9	108.6	109.1	24	110.4	114.7	115.1	24	112.2	114.1	115.1	24					07/03
07/04	109.2	109.6	110.7	24	114.1	114.6	114.8	24	109.4	114.2	113.0	24					07/04
07/05	112.1	112.6	112.9	23	116.5	116.7	117.3	23	112.7	115.3	116.9	23					07/05

Hours used in calculating values:

24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
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FISH PASSAGE CENTER

Smolt Monitoring Program Two Week Passage Index Report

Date 7/6/2018 7:17:10 AM

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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)
06/22/2018					0	0	27	0	409		0
06/23/2018					28	0	54	0		0	146
06/24/2018					0	0	0	0	410		19
06/25/2018		11			56	59	54	0		76	0
06/26/2018		7			87	60	83	0	2		0
06/27/2018		7			0	29	60	0		0	26
06/28/2018		4			29	29	57	0	0		0
06/29/2018		7			15	0	90	0		0	0
06/30/2018					16	0	63	0	408		0
07/01/2018					17	14	18	0		0	0
07/02/2018					0	0	33	0	410		0
07/03/2018					0	1	0	0		0	0
07/04/2018					0	0	34	0	0		0
07/05/2018					0	0	17	0		0	0
07/06/2018											
Total:	0	36	0	0	248	192	590	0	1,639	76	191
# Days:	0	5	0	0	14	14	14	14	7	7	14
Average:	0	7	0	0	18	14	42	0	234	11	14
YTD:	23,452	41,193	21,824	12,792	4,638,959	2,838,047	2,045,153	49,702	1,494,204	1,257,304	1,890,654

Number of hours sampled:

- No data available or no sample conducted

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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FISH PASSAGE CENTER

Smolt Monitoring Program Two Week Passage Index Report

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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)
06/22/2018					11,598	35,279	5,030	621	70,807		12,223
06/23/2018					5,314	5,516	4,108	593		29,535	15,030
06/24/2018					6,938	4,583	7,028	272	134,120		29,194
06/25/2018		0			14,476	9,510	14,006	178		66,516	26,203
06/26/2018		0			9,211	8,574	2,439	227	118,965		22,014
06/27/2018		0			3,711	3,930	2,025	203		35,303	33,879
06/28/2018		0			3,025	5,195	2,030	219	99,507		42,348
06/29/2018		0			3,964	8,453	1,935	210		41,826	26,889
06/30/2018					3,734	2,771	1,958	363	67,308		26,496
07/01/2018					4,152	3,879	2,767	497		30,692	18,114
07/02/2018					2,674	3,851	1,938	339	81,006		27,036
07/03/2018					2,579	3,558	2,232	210		36,968	14,443
07/04/2018					4,011	3,457	4,774	218	52,774		18,981
07/05/2018					3,263	4,484	6,271	240		21,013	25,561
07/06/2018											
Total:	0	0	0	0	78,650	103,040	58,541	4,390	624,487	261,853	338,411
# Days:	0	5	0	0	14	14	14	14	7	7	14
Average:	0	0	0	0	5,618	7,360	4,182	314	89,212	37,408	24,172
YTD:	0	6	89	192	788,722	852,917	453,915	25,015	1,642,590	662,799	2,095,836

Number of hours sampled:

- No data available or no sample conducted

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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FISH PASSAGE CENTER

Smolt Monitoring Program Two Week Passage Index Report

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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)
06/22/2018					85	29	27	11	0		761
06/23/2018					0	72	27	17		0	878
06/24/2018					137	29	26	17	0		987
06/25/2018		0			167	72	27	3		152	494
06/26/2018		0			58	100	28	9	0		1,018
06/27/2018		0			29	43	0	5		0	294
06/28/2018		0			0	29	28	6	516		281
06/29/2018		0			15	38	30	6		0	180
06/30/2018					0	14	47	8	0		689
07/01/2018					0	0	0	8		0	334
07/02/2018					0	14	0	3	0		149
07/03/2018					0	0	34	4		0	0
07/04/2018					9	0	17	4	0		21
07/05/2018					0	14	52	9		0	0
07/06/2018											
Total:	0	0	0	0	500	454	343	110	516	152	6,086
# Days:	0	5	0	0	14	14	14	14	7	7	14
Average:	0	0	0	0	36	32	25	8	74	22	435
YTD:	0	0	1,224	1,365	262,444	215,198	42,454	44,129	226,100	119,790	477,247

Number of hours sampled:

- No data available or no sample conducted

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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FISH PASSAGE CENTER

Smolt Monitoring Program Two Week Passage Index Report

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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)
06/22/2018					113	658	81	19	205		51
06/23/2018					140	72	27	19		0	98
06/24/2018					192	200	26	16	412		96
06/25/2018		4			139	100	82	15		152	55
06/26/2018		8			145	240	55	17	18		127
06/27/2018		5			115	86	3	21		0	38
06/28/2018		0			117	160	28	13	0		281
06/29/2018		2			15	210	15	8		0	180
06/30/2018					32	86	0	3	0		0
07/01/2018					17	86	0	3		0	0
07/02/2018					34	57	33	8	0		149
07/03/2018					36	3	0	1		0	0
07/04/2018					0	14	0	1	0		0
07/05/2018					37	72	17	5		0	0
07/06/2018											
Total:	0	19	0	0	1,132	2,044	367	149	635	152	1,075
# Days:	0	5	0	0	14	14	14	14	7	7	14
Average:	0	4	0	0	81	146	26	11	91	22	77
YTD:	723	27,444	3,888	5,328	3,924,678	3,003,978	1,942,547	24,872	240,966	681,267	356,552

Number of hours sampled:

- No data available or no sample conducted

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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FISH PASSAGE CENTER

Smolt Monitoring Program Two Week Passage Index Report

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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)
06/22/2018					0	0	0	3	0		51
06/23/2018					0	0	0	0		0	0
06/24/2018					0	0	0	3	0		0
06/25/2018		0			0	14	0	2		76	0
06/26/2018		0			0	0	0	2	0		0
06/27/2018		0			0	0	0	3		0	0
06/28/2018		0			0	0	0	2	0		141
06/29/2018		0			0	2	0	3		0	0
06/30/2018					0	0	0	6	0		0
07/01/2018					0	0	0	2		0	0
07/02/2018					0	0	0	1	0		0
07/03/2018					18	0	0	3		0	0
07/04/2018					0	0	0	4	0		0
07/05/2018					0	0	0	0		0	0
07/06/2018											
Total:	0	0	0	0	18	16	0	34	0	76	192
# Days:	0	0	0	0	1	1	0	2	0	11	14
Average:	0	0	0	0	1	1	0	2	0	11	14
YTD:	0	0	4	115	260,629	120,844	58,600	76,219	1,526,876	383,702	741,292

Number of hours sampled:

- No data available or no sample conducted

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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FISH PASSAGE CENTER

Smolt Monitoring Program Two Week Passage Index Report

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COMBINED LAMPREY JUVENILES

Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR* (Sample)	LGS (Coll)	LMN (Coll)	RIS (Coll)	MCN (Coll)	JDA (Coll)	BO2 (Coll)
06/22/2018					6	400	0	1	0		75
06/23/2018					1	0	0	1		200	0
06/24/2018					13	0	0	2	0		30
06/25/2018		0			4	0	140	0		150	50
06/26/2018		0			7	20	80	1	0		50
06/27/2018		0			5	0	160	0		100	0
06/28/2018		0			11	0	20	1	200		50
06/29/2018		0			3	0	20	0		500	0
06/30/2018					1	0	30	0	0		0
07/01/2018					3	50	0	1		200	67
07/02/2018					2	50	10	1	200		133
07/03/2018					1	0	10	0		250	134
07/04/2018					1	0	20	0	200		0
07/05/2018					2	0	0	1		150	67
07/06/2018											
Total:	0	0	0	0	60	520	490	9	600	1,550	656
# Days:	0	5	0	0	14	15	18	14	7	7	15
Average:	0	0	0	0	4	35	27	1	86	221	44
YTD:		1	3		430	35,609	56,660	361	218,762	227,128	26,788

- No data available or no sample conducted

- 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.

Number of hours sampled:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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Smolt Monitoring Program Two Week Passage Index Report

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Smolt Monitoring Program Sites and Agency Collaborations:

- 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
- LGS (Index) - Little Goose Bypass Collection System : Passage Index Counts
- LMN (Index) - Lower Monumental Dam Bypass Collection System : Passage Index Counts
- RIS (Index) - Rock Island Dam Second Powerhouse Bypass Trap : Passage Index Counts
- MCN (Index) - McNary Dam Bypass Collection System : Passage Index Counts
- JDA (Index) - John Day Dam Bypass Collection System : Passage Index Counts
- BO2 (Index) - Bonneville Dam Second Powerhouse Bypass Collection System : Passage Index Counts

- No data available or no sample conducted

Number of hours sampled:



Important Information About this Report:

- For clip information see: <http://www.fpc.org/currentdaily/smpcomments.htm>
- Three 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. Equations for passage index are provided below for each site.
 - LGR, LGS, LMN, MCN, JDA (Index) = Lower Granite Dam Bypass Collection System : Passage Index Counts Passage Index = Collection Counts / (Powerhouse Flow / (Powerhouse Flow + Spill))
 - RIS, BO2 (Index) = Rock Island Dam Second Powerhouse Bypass Trap : Passage Index Counts Passage Index = Collection Counts / (Powerhouse 2 Flow / (Powerhouse 1 & 2 Flow + Spill))
- 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.
- 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.

FISH PASSAGE CENTER

Two Week Transportation Summary Report 6/22/2018 12:00:00 AM TO 7/6/2018 12:00:00 AM

Date 7/6/2018 7:17:45 AM

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Lower Granite Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	52,960	170	355	10	780	55,055
Sum of Number Barged	51,696	170	355	9	779	53,788
Sum of Number Bypassed	1,087	0	0	1	0	1,088
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	28	0	0	0	0	28
Sum of Facility Morts	143	0	0	0	1	145
Sum of Reseach Morts	6	0	0	0	0	6
Sum of Total Project Mort	177	0	0	0	1	179

Little Goose Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	70,351	134	310	11	1,389	73,584
Sum of Number Barged	70,213	133	309	9	1,387	73,438
Sum of Number Bypassed	6	0	0	0	0	6
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	24	0	0	0	0	24
Sum of Facility Morts	108	1	1	2	2	116
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	132	1	1	2	2	140

FISH PASSAGE CENTER

Two Week Transportation Summary Report

6/22/2018 12:00:00 AM TO 7/6/2018 12:00:00 AM

Date 7/6/2018 7:17:45 AM

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Lower Monumental Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	39,973	403	230	0	262	41,130
Sum of Number Barged	39,926	399	229	0	262	41,078
Sum of Number Bypassed	0	0	0	0	0	0
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	1	0	0	0	0	1
Sum of Facility Morts	46	4	1	0	0	51
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	47	4	1	0	0	52

Total

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	163,284	707	895	21	2,431	169,769
Sum of Number Barged	161,835	702	893	18	2,428	168,304
Sum of Number Bypassed	1,093	0	0	1	0	1,094
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	53	0	0	0	0	53
Sum of Facility Morts	297	5	2	2	3	312
Sum of Reseach Morts	6	0	0	0	0	6
Sum of Total Project Mort	356	5	2	2	3	371

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Lower Granite Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	486688	3041113	182781	188701	2522898	8945079
Sum of Number Barged	471523	2429137	179178	184065	1811277	6886457
Sum of Number Bypassed	14307	610813	3539	4465	711353	2055830
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	75	58	0	9	44	230
Sum of Facility Morts	766	1063	64	162	189	2433
Sum of Reseach Morts	17	42	0	0	35	129
Sum of Total Project Mort	858	1163	64	171	268	2792

Little Goose Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	507898	1857030	137050	74658	1969289	6515214
Sum of Number Barged	503384	1546146	136331	66127	1357230	4966448
Sum of Number Bypassed	854	306206	407	7716	611659	1538501
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	67	40	3	12	13	148
Sum of Facility Morts	3593	4638	309	803	387	10117
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	3660	4678	312	815	400	10265

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Lower Monumental Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	274893	1218008	24930	35290	1178417	3909955
Sum of Number Barged	274736	1018113	24827	33644	926102	3203524
Sum of Number Bypassed	0	199433	100	1598	252167	705465
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	7	7	0	3	7	31
Sum of Facility Morts	150	455	3	45	141	935
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	157	462	3	48	148	966

Total

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	1269479	6116151	344761	298649	5670604	19370248
Sum of Number Barged	1249643	4993396	340336	283836	4094609	15056429
Sum of Number Bypassed	15161	1116452	4046	13779	1575179	4299796
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	149	105	3	24	64	409
Sum of Facility Morts	4509	6156	376	1010	717	13485
Sum of Reseach Morts	17	42	0	0	35	129
Sum of Total Project Mort	4675	6303	379	1034	816	14023

Cumulative Adult Passage at Mainstem Dams Through: 07/05

dam	enddate	Spring Chinook						Summer Chinook						Fall Chinook					
		2018		2017		10-Yr Avg.		2018		2017		10-Yr Avg.		2018		2017		10-Yr Avg.	
		Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack
BON	07/05	87894	6456	83624	18110	152393	25835	48954	3066	68677	8232	78195	16587	0	0	0	0	0	0
TDA	07/05	57935	4793	58310	12497	119227	21697	38528	2637	52341	6771	62307	12471	0	0	0	0	0	0
JDA	07/05	50572	5053	46675	12475	103731	20380	32813	3038	44636	5034	53737	11473	0	0	0	0	0	0
MCN	07/02	44427	3472	44292	7020	94405	16297	28149	1411	34334	3171	42105	7462	0	0	0	0	0	0
IHR	07/05	32600	2197	28306	6949	68113	11204	5041	432	7175	1759	15262	3885	0	0	0	0	0	0
LMN	07/05	35398	3020	28545	8270	68100	11017	4955	538	6281	2454	15503	4322	0	0	0	0	0	0
LGS	07/05	31834	2486	26598	8335	63992	12109	5937	445	6684	2616	14148	4472	0	0	0	0	0	0
LGR	07/05	31161	2948	27357	8256	62850	13009	5613	561	5903	2454	12298	4275	0	0	0	0	0	0
PRD	07/03	7067	949	7268	783	18018	1858	21026	727	22592	647	23554	941	0	0	0	0	0	0
WAN	07/03	8071	964	6612	484	17542	2163	15422	337	20177	357	19568	804	0	0	0	0	0	0
RIS	07/04	7894	997	8080	564	18255	2598	15940	278	19891	225	18931	1013	0	0	0	0	0	0
RRH	07/04	5919	807	5864	406	8195	1153	12042	107	11469	141	10932	414	0	0	0	0	0	0
WEL	07/04	7500	976	6589	820	8670	1609	4408	123	4359	71	4653	225	0	0	0	0	0	0
WFA	07/01	22405	1863	30539	2075	32567	1409	0	0	0	0	0	0	0	0	0	0	0	0

DAM	ENDDATE	Coho						Sockeye			Steelhead						Lamprey				
		2018		2017		10-Yr Avg.		10-Yr		10-Yr			Unclipped		Unclipped		10-Yr		10-Yr		
		Adult	Jack	Adult	Jack	Adult	Jack	2018	2017	Avg.	2018	2017	Avg.	2018	2017	Avg.	2018	2017	Avg.	2018	2017
BON	07/05	1	-1	0	0	0	0	168607	74937	272437	9988	5847	19439	4506	2124	7502	25739	44396	11952		
TDA	07/05	4	0	0	0	0	0	126019	52061	218532	2633	1963	8406	1268	746	3587	4720	8694	2227		
JDA	07/05	0	0	0	0	0	1	136737	53325	204240	1785	857	8961	1065	578	3669	2756	4793	1378		
MCN	07/02	-4	0	0	0	1	0	104437	34948	138865	961	2617	6250	500	786	2283	275	62	71		
IHR	07/05	-1	0	0	0	0	0	264	212	394	1678	1192	5574	591	539	1822	161	49	31		
LMN	07/05	0	0	0	0	0	0	117	100	378	1528	1555	9340	504	753	3080	127	13	1		
LGS	07/05	0	0	0	0	0	0	82	40	275	1423	1530	5495	411	674	2671	12	1	0		
LGR	07/05	0	0	0	0	0	0	50	43	190	4701	7333	9058	1344	3069	3762	6	2	0		
PRD	07/03	0	0	0	0	0	0	98439	30438	111396	148	147	346	0	0	0	1118	463	163		
WAN	07/03	0	0	0	0	0	0	78853	26269	84607	128	110	364	0	0	0	768	323	86		
RIS	07/04	0	0	0	0	0	0	67224	19916	75512	150	103	248	81	42	130	169	36	5		
RRH	07/04	0	0	0	0	0	0	57615	9442	49622	129	147	401	54	38	247	42	3	0		
WEL	07/04	0	0	0	0	0	0	41494	5618	30779	157	70	117	59	49	73	91	1	0		
WFA	07/01	0	2	117	117	0	0	0	0	0	8987	2335	18253	2015	727	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.

