



## Fish Passage Center

# Weekly Report #18–24

August 17, 2018

### This Week's Highlights

#### Water Supply

Precipitation throughout the Columbia Basin has varied between 0% and 13% of average at individual sub-basins over August. Precipitation above The Dalles has been 9% of average over August. Over the 2018 water year, precipitation has ranged between 86% and 107% of average.

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

Location	Water Year 2018 August 1-15, 2018		Water Year 2018 October 1, 2017 to August 15, 2018	
	Observed (inches)	% Average	Observed (inches)	% Average
	Columbia Above Coulee	0.12	13	33.3
Snake River Above Ice Harbor	0.01	3	19.1	89
Columbia Above The Dalles	0.05	9	23.4	91
Kootenai	0.13	13	32.4	93
Clark Fork	0.04	5	27.2	106
Flathead	0.01	1	34.0	102
Pend Oreille River Basin above Waneta Dam	0.02	3	30.7	101
Salmon River Basin	0.00	1	25.4	94
Upper Snake Tributaries	0.04	7	22.9	92
Clearwater	0.00	0	41.1	107
Willamette River above Portland	0.01	2	54.3	86

Grand Coulee Reservoir is at 1282.4 feet (8-16-18) and has refilled 0.2 foot over the last week. Outflows at Grand Coulee have ranged between 79.2 Kcfs and 102.0 Kcfs over the last week.

The Libby Reservoir is currently at elevation 2446.4 feet (8-16-18) and has drafted 0.7 feet over the past week. Daily average outflows at Libby Dam have been 9.0 Kcfs over the last week.

Hungry Horse is currently at an elevation of 3556.2 feet (8-16-18) and has refilled 0.9 feet last week. Outflows at Hungry Horse have been 2.4-2.7 Kcfs over the last week.

Dworshak is currently at an elevation of 1549.0 feet (8-16-18) and has drafted 7.2 feet last week. Dworshak outflows have been 7.5 to 13.0 Kcfs.

The Brownlee Reservoir was at an elevation of 2056.0 feet on August 16<sup>th</sup>, 2018 and has drafted 1.2 feet. Outflows at Hells Canyon have ranged between 9.4 and 19.1 Kcfs over the last four days.

The Biological Opinion flow period began on April 3<sup>rd</sup> in the lower Snake River (Lower Granite). According to the April Final Water Supply Forecast (April 4<sup>th</sup>, 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 21<sup>st</sup>, 2018 at Lower Granite (Flow Objective = 53.3 Kcfs), flows have averaged 40.2 Kcfs over the summer period and 30.5 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. McNary flows have averaged 169.3 Kcfs over the summer period and 145.7 Kcfs last week.

## Spill

Flows in the Lower Snake River this week were similar to the previous week. Daily average flows at Lower Granite Dam ranged from 27.5 to 34.5 Kcfs this week. Flows in the mid-and Upper Columbia River this week were also similar to the previous week. Daily average flows at McNary and Rock Island dams ranged from 122.2 to 168.8 Kcfs and 86.1 to 117.9 Kcfs this week, respectively. Current forecasts show flows in the 24.0 to 30.0 Kcfs range at Lower Granite Dam and 110.0 to 142.0 Kcfs at McNary Dam over the next week.

Dworshak continued its summer draft operation, with daily average discharge ranging from 7.6 to 13.0 Kcfs over the last week. Hells Canyon Complex flows this week were similar to the previous week, with daily average outflows at Hells Canyon Dam ranging from 10.3 to 13.7 Kcfs over the last week. The daily average temperature in the Lower Granite tailrace remained below 68 °F all of this week.

The 2018 spill for fish passage program at the lower Snake River and Mid-Columbia FCRPS projects began just after midnight on April 3<sup>rd</sup> and April 10<sup>th</sup>, respectively. Spring spill operations at these projects ran through June 15<sup>th</sup> in the Mid-Columbia and June 20<sup>th</sup> in the Snake River. According to the Fish Operations Plan, summer spill operations began at 0001 on June 16<sup>th</sup> at the Mid-Columbia River sites and 0001 on June 21<sup>st</sup> at the Snake River sites. These summer spill operations will run through August 31<sup>st</sup> 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 (LGR) is 18 Kcfs, 24-hours per day. However, LGR underwent Doble testing from August 13<sup>th</sup> through

August 16<sup>th</sup>. During the testing, spill at LGR was increased to as high as 28 Kcfs for up to five hours each day. Other than the excess spill during Doble testing, the summer spill volume at LGR was generally met this week. There were a few instances when flows were sufficiently low that 18 Kcfs spill was not possible. Spill during these times was all flows in excess of powerhouse minimum requirements. There were no exceedences in total dissolved gas (TDG) waiver limits in the LGR tailrace or the Little Goose (LGS) forebay this week. The RSW at LGR has been closed since the afternoon of August 8<sup>th</sup>. Flows have been sufficiently low this week to warrant a set spill volume operation at LGS. This set spill volume has ranged from 9 Kcfs to ~10.5 Kcfs, depending on daily average flows from the previous day. There were no exceedences in TDG waiver limits in the LGS tailrace or Lower Monumental (LMN) forebay. The RSW at LGS has been closed since the afternoon of August 3<sup>rd</sup>. The summer spill operation for LMN is 17 Kcfs, 24-hours per day. Summer spill volumes at LMN were generally met this week. There were a few instances when flows were sufficiently low that 17 Kcfs spill was not possible. Spill during these times was all flows in excess of powerhouse minimum requirements. There were no exceedences in TDG waiver limits in the LMN tailrace or the Ice Harbor (IHR) forebay this week. The RSW at LMN has been closed since the afternoon of August 8<sup>th</sup>. The summer spill operation for IHR is 45 Kcfs during the day and gas cap spill at night for the remainder of the season. Summer spill volumes at IHR were met this week. However, due to low flows, the 45 Kcfs daytime spill and/or nighttime spill to the gas cap was not 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. The RSW at IHR continued to operate this week.

The summer spill operations at McNary (MCN), John Day (JDA), and The Dalles (TDA) dams are 50%, 30%, and 40% of instantaneous flows, respectively. These summer spill operations were met at all three projects this week and there were no exceedences of TDG waiver limits in their respective tailraces or downstream forebays. The Dalles forebay monitor has been out of service since the afternoon of August 15<sup>th</sup>. 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 through the end of the summer spill season. This summer spill operation has been met this week. It is worth noting that there were some periods when flows were sufficiently low that these spill levels were not always possible. During these times, spill was all flows in excess of powerhouse minimum requirements. Total dissolved gas in the BON tailrace (at Cascades Island) has remained below the 120% waiver limit.

**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 Monitoring**

Due to decreasing fish numbers and an inability to reach sample size requirements, Gas bubble trauma (GBT) monitoring in smolts did not occur this week.

### **Temperature**

Forebay temperatures are now being reported for Lower Granite, Ice Harbor, McNary and Bonneville dams. Currently, forebay temperatures at Bonneville, McNary, and Lower Granite dams are all approximately 1 to 2 °F higher than their respective 10-year averages for this time of year. The daily average temperature for August 16<sup>th</sup> was 72.2 °F at Bonneville, 71.2 °F at McNary, and 67.9 °F at Lower Granite. The current 10-year averages for these three projects are 70.8 °F, 70.0 °F, and 66.0 °F, respectively. The forebay temperature at Ice Harbor Dam is similar to the current 10-year average. The daily average temperature for August 16<sup>th</sup> in the Ice

Harbor forebay was 70.9 °F and the current 10-year average for that date is 70.4 °F.

### **Smolt Monitoring**

Smolt Monitoring Program (SMP) activities continued at all bypass facilities this week. This week’s samples were dominated by subyearling Chinook at all seven SMP bypass facilities. When compared to last week, passage of subyearling Chinook decreased at nearly all bypass facilities. The one exception was Lower Granite Dam where this week’s daily average passage index for subyearling Chinook was slightly higher than the previous week.

After three days of suspended sampling due to an outage at the second powerhouse for roof repairs, sampling at Bonneville resumed at 0700 on August 10<sup>th</sup>, for the August 11<sup>th</sup> sample. In addition, sampling at Bonneville Dam (BON) remained in the high temperature protocol this week, where sampling is reduced to a 24-hour sample every-other-day. The high temperature sampling protocol will remain in effect until daily average temperatures in the Bonneville forebay drop below 69.5 °F. This week’s samples at BON were dominated by subyearling Chinook. This week’s daily average passage index for subyearling Chinook was about 600 per day, which is a decrease from last week’s daily average passage index of about 1,500 per day. No spring migrants were encountered in this week’s samples. No lamprey juveniles were encountered in this week’s samples.

Sampling at John Day Dam (JDA) remained in the high temperature protocol this week, where sampling is reduced to a 6-hour sample, twice per week, for condition only. The condition only samples occur on Monday and Thursday and data from these samples are transmitted to FPC on Tuesday and Friday of each week. This high temperature sampling protocol will remain in effect until daily average temperatures in the John Day forebay drop below 69.5 °F. Subyearling Chinook dominated the two samples at JDA this week. The only other species that were encountered in this week’s samples were steelhead.

McNary (MCN) has been operating under the high temperature sampling protocol since mid-July. Under the high temperature sampling protocol, sampling remains every-other-day but the target sample size is reduced from 300-500 fish per day to approximately 100 fish per day. This protocol will remain in effect

until daily average forebay temperatures drop below 68 °F. At the time of writing this weekly report, data from the sample on August 16<sup>th</sup> were missing. Subyearling Chinook dominated this week's samples at MCN. This week's daily average passage index for subyearling Chinook was about 570 per day, which is a decrease from last week's daily average passage index of nearly 1,500 per day. No spring migrants were encountered in this week's samples. Pacific lamprey macrophthalmia were encountered in both of this week's samples and no ammocoetes were encountered this week.

The juvenile transportation program transitioned from barging to trucking this week. As a result, samples from Lower Granite Dam (LGR) may be held for up to 48-hours before being enumerated. Therefore, data from LGR may be delayed for 1-2 days over the remainder of the season. 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 800 per day, which is a slight increase from last week's daily average passage index of about 760 per day. It is worth noting that two of last week's samples were reduced (by 2-3 hours) samples. Very few spring migrants were encountered in this week's samples. No Pacific lamprey macrophthalmia were encountered this week but Pacific lamprey ammocoetes were encountered in two of this week's samples at LGR.

Even through the juvenile transportation program transitioned from barging to trucking this week, samples from Little Goose Dam (LGS) are still enumerated and sent to FPC daily. Subyearling Chinook continued to dominate the samples at LGS this week. This week's daily average passage index for subyearling Chinook was nearly 400 per day, which is a decrease from last week's daily average passage index of about 670 per day. Very few spring migrants were encountered in this week's samples. Pacific lamprey macrophthalmia were encountered in three of this week's samples and ammocoetes were encountered every day this week. The daily average collection for Pacific lamprey ammocoetes was seven per day.

Similar to LGR, samples from Lower Monumental Dam (LMN) are held for up to 48-hours before being enumerated, due to the transition to trucking. Therefore, data from LMN may be delayed for 1-2 days over the remainder of the season. In addition, the sample from August 15<sup>th</sup> was a reduced sample of only

16 hours. This was to accommodate the transition to trucking. This week's samples at LMN were dominated by subyearling Chinook. This week's daily average passage index for subyearling Chinook was nearly 100 per day, which is a decrease from last week's daily average passage index of about 130 per day. The only spring migrants that were encountered this week were steelhead, which were encountered in only one (August 12<sup>th</sup>) of this week's samples. Finally, Pacific lamprey macrophthalmia were encountered in four of this week's samples while no Pacific ammocoetes were encountered this week.

Subyearling Chinook continued to dominate the samples at Rock Island Dam (RIS). This week's daily average passage index for subyearling Chinook was about 50 per day, which is a decrease from last week's daily average passage index of nearly 100 per day. Passage of spring migrants remained very low this week. No lamprey juveniles were encountered in this week's samples at RIS.

### **Hatchery Releases**

FPC has not received all data from some hatcheries as of 08/17/18, 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 scheduled releases into this zone, nor are there any scheduled for the next two.

## Lower Columbia Zone:

The Lower Columbia Zone is defined as the Columbia River and its tributaries below Bonneville Dam. In the past week there were no scheduled releases into this zone, nor are there any scheduled for the next two.

## Adult Passage

Adult Passage Daily passage numbers at Bonneville Dam ranged between 1 and 12 adult Chinook in the last week. The 2018 Bonneville Dam adult fall Chinook count of 5,174 is about 84.8% of the 2017 count and 40.2% of the 10-year average. At Willamette Falls, 24,543 adult spring Chinook have been counted so far this year. In 2017, 34,117 adult spring Chinook were counted at Willamette Falls. This year's count is about 71.8% of the 2017 count and 68.6% of the 10-year average count of 35,770. As of August 16th, a total of 557 adult fall Chinook have been counted at McNary Dam and 103 have been counted at Ice Harbor Dam. The 2018 McNary Dam adult summer Chinook count is about 90% of the 2017 count and 19.6% of the 10-year average count.

The 2018 Bonneville Dam adult steelhead count of 51,137 is about 1.5 times greater than the 2017 count of 39,195, while being about 29% of the 10-year average count of 176,005. The 2018 Bonneville Dam adult unclipped steelhead count of 21,483 is about 1.2 times greater than the 2017 count of 18,056, while being 30% of the 10-year average count of 71,510. Daily adult steelhead counts at Lower Granite Dam ranged from 16 to 37 adults per day last week. This year's Lower Granite steelhead count of 6,078 has 1,671 fewer fish than the 2017 count of 7,749 and is about 39.6% of the 10-year average count of 15,365. The 2018 Lower Granite Dam adult unclipped steelhead count of 2,105 has 1,242 fewer fish than the 2017 count of 3,347 and 4,435 fewer fish than the 10-year average count of 6,540. At Willamette Falls, the 2018 count for steelhead was 10,458 as of August 15th. This year's steelhead count is about 3.9 times greater than the 2017 count of 2,683 while being 51% of the 10-year average count of 20,498.

Daily adult sockeye passage numbers at Bonneville Dam ranged between 2 and 14 last week. The 2018 adult sockeye count at Bonneville Dam of 193,774 is about 2.2 times greater than the 2017 count, while being 60.2% of the 10-year average count. The 2018 adult sockeye count at McNary Dam of 155,394 is

about 2.7 times greater than the 2017 count, while being 67.5% of the 10-year average count. The Lower Granite Dam 2018 adult sockeye count of 272 has 46 more fish than the 2017 count of 226 and 803 fewer fish than the 10-year average count of 1,075. The 2018 Bonneville Dam adult coho count of 122 has 114 more fish than the 2017 count and 153 fewer fish than the 10-year average count.

As of August 16th at Bonneville Dam, the adult shad count was 6,057,744. This year's shad count is about 1.9 times greater than the 2017 count of 3,133,357 and 2.9 times greater than the 10-year average count of 2,101,066. A total of 40,547 lampreys have been counted at Bonneville Dam so far this year. The Bonneville 2018 lamprey count is about 51.4% of the 2017 count of 78,890, while being about 1.5 times greater than the 10-year average count of 27,693.

## Hatchery Releases Last Two Weeks

### Hatchery Release Summary

From: **8/3/2018** to **8/17/2018**

Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver	Zone
No Planned Releases										
<b>Grand Total</b>					0					

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

## Hatchery Releases Next Two Weeks

### Hatchery Release Summary

From: **8/18/2018** to **8/31/2018**

Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver	Zone
No Planned Releases										
<b>Grand Total</b>					0					

**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
08/03/2018	97.0	0.1	97.8	0.0	102.5	16.7	91.6	8.6	92.3	18.2	67.2	19.6	63.7	20.3
08/04/2018	100.7	0.1	102.3	0.0	109.8	17.8	109.9	17.5	111.3	18.2	120.2	30.0	118.3	22.5
08/05/2018	85.1	0.1	82.8	0.0	95.5	9.3	96.1	8.6	104.4	18.2	118.0	24.5	113.1	19.8
08/06/2018	94.9	0.1	96.8	0.0	90.7	8.6	89.3	9.1	90.6	20.9	109.9	18.6	109.5	19.0
08/07/2018	115.3	0.1	109.3	0.0	113.2	19.6	108.0	0.1	109.8	22.5	107.2	18.6	104.0	18.7
08/08/2018	119.8	0.1	118.3	0.0	118.9	21.8	116.9	0.0	122.5	22.2	126.8	18.9	123.4	19.0
08/09/2018	120.1	0.1	118.2	0.0	119.4	24.5	114.5	0.0	118.4	20.5	130.3	18.3	123.5	19.6
08/10/2018	101.9	0.1	106.6	0.0	110.0	11.4	108.2	0.0	117.9	18.6	124.6	19.1	122.9	19.8
08/11/2018	79.2	0.0	79.3	0.0	88.7	9.9	83.0	0.0	86.1	16.8	80.5	18.1	79.1	19.4
08/12/2018	88.1	0.1	92.4	0.0	88.8	12.7	84.1	0.0	86.9	16.0	93.1	19.3	90.8	20.0
08/13/2018	93.7	0.1	92.9	0.0	98.6	10.1	102.4	0.0	109.5	20.0	113.7	19.8	109.0	19.2
08/14/2018	93.1	0.1	86.8	0.0	89.5	9.3	86.9	0.0	88.3	21.8	119.1	18.2	117.2	19.5
08/15/2018	98.0	0.1	97.2	0.0	100.4	9.8	96.6	0.0	100.2	3.6	109.5	17.0	105.9	18.8
08/16/2018	95.7	0.1	93.0	0.0	98.5	9.5	95.9	0.0	100.4	0.0	96.2	16.8	94.2	19.4

**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
08/03/2018	12.9	3.0	---	---	31.7	17.7	32.1	10.9	33.5	17.0	35.6	25.6
08/04/2018	10.6	0.6	---	---	30.7	17.6	30.3	9.1	30.2	16.5	32.9	22.9
08/05/2018	10.4	0.6	---	---	28.8	15.7	31.0	10.5	30.3	16.9	32.3	22.5
08/06/2018	11.9	1.9	---	---	27.9	14.7	28.1	16.8	27.9	14.5	27.8	18.2
08/07/2018	13.0	3.0	---	---	32.4	17.6	31.0	18.7	30.8	16.9	35.3	25.7
08/08/2018	13.0	2.9	---	---	32.2	17.4	32.4	20.2	33.3	16.4	33.4	23.6
08/09/2018	12.3	2.9	---	---	36.0	17.6	33.5	21.8	33.9	17.0	36.9	26.9
08/10/2018	13.0	2.9	---	---	32.0	17.9	31.6	9.4	29.5	16.1	29.5	19.7
08/11/2018	10.1	0.0	---	---	34.5	17.6	31.9	10.5	30.8	16.7	31.9	21.9
08/12/2018	10.1	0.0	---	---	27.5	14.5	26.5	10.5	27.1	13.6	27.9	18.1
08/13/2018	10.1	0.0	---	---	29.2	18.8	27.9	8.6	25.2	11.6	27.0	17.0
08/14/2018	10.1	0.0	---	---	30.9	19.3	28.3	8.7	27.6	11.0	30.5	20.3
08/15/2018	10.2	0.0	---	---	29.9	19.8	29.1	10.4	28.4	15.0	31.3	20.8
08/16/2018	7.6	0.0	---	---	29.4	20.0	27.1	10.4	25.3	11.8	27.2	17.1

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

Date	McNary		John Day		The Dalles		Bonneville			
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	PH1	PH2
08/03/2018	121.1	60.7	114.8	34.4	106.4	42.6	123.9	80.0	0.0	31.5
08/04/2018	138.2	69.2	131.5	39.4	122.2	48.9	130.9	85.3	0.0	33.2
08/05/2018	136.0	68.1	125.9	37.3	116.2	46.3	151.0	90.2	0.0	48.5
08/06/2018	156.5	78.3	155.8	46.6	149.0	59.6	161.8	96.1	41.3	12.0
08/07/2018	159.5	79.8	147.4	44.1	126.8	50.7	153.4	100.6	40.3	0.0
08/08/2018	148.8	74.5	145.4	43.5	135.7	54.2	138.6	95.4	30.8	0.0
08/09/2018	163.6	81.8	147.2	43.9	133.3	52.9	140.3	91.5	22.1	14.3
08/10/2018	168.8	84.5	157.1	47.1	146.6	58.9	161.5	96.5	3.2	49.3
08/11/2018	143.8	72.3	136.4	41.1	124.8	49.8	145.4	101.1	0.0	31.9
08/12/2018	122.2	61.4	119.4	35.8	108.2	43.5	125.5	82.6	0.0	30.5
08/13/2018	133.9	67.2	123.5	37.0	116.2	46.8	124.2	80.7	2.0	29.1
08/14/2018	156.7	78.8	142.8	42.9	129.6	52.7	138.6	93.8	0.0	32.4
08/15/2018	156.7	78.9	154.2	46.1	142.2	56.5	148.4	99.5	0.0	36.5
08/16/2018	137.8	69.2	136.7	41.0	123.5	49.2	139.9	95.9	0.0	31.6

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

Site	Date & Species	Number of Fish	Number w/ GBT signs	Number w/ Fin Signs	% Fin GBT	% Severe Fin GBT	Number of Fish with Fin GBT Listed by Highest Rank			
							Rank 1	Rank 2	Rank 3	Rank 4
<b>Lower Granite Dam</b>										
<b>Little Goose Dam</b>										
<b>Lower Monumental Dam</b>										
<b>McNary Dam</b>										
	08/08/18 Chinook + Steelhead	61*	0	0			0	0	0	0
<b>Bonneville Dam</b>										
	08/05/18 Chinook + Steelhead	6*	0	0			0	0	0	0
<b>Rock Island Dam</b>										
	08/07/18 Chinook + Steelhead	9*	1	1			1	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)**

Date 8/17/2018 7:15:11 AM

Page 1 of 4

**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	
08/03									107.6	108.0	108.0	24	107.6	108.4	109.7	24	107.1	107.6	107.7	24	106.7	107.4	107.8	24	08/03
08/04									107.3	107.4	107.9	24	107.1	107.7	108.7	24	107.1	107.5	107.8	24	106.5	107.0	107.5	24	08/04
08/05									107.0	107.4	107.4	24	107.0	107.9	109.5	24	107.3	107.5	107.7	24	106.8	107.1	107.5	24	08/05
08/06									106.8	107.1	107.2	24	106.6	107.3	109.1	24	107.1	107.5	107.6	24	106.7	107.0	107.2	24	08/06
08/07									107.0	107.2	107.3	24	106.4	107.1	108.8	24	107.3	107.5	107.7	24	106.8	106.9	107.3	24	08/07
08/08									107.2	107.4	107.6	24	106.3	106.9	108.3	24	107.4	107.8	108.4	24	107.0	107.2	107.9	24	08/08
08/09									107.2	107.4	107.6	24	106.4	107.0	109.0	24	106.7	107.6	107.7	24	106.2	107.0	107.1	24	08/09
08/10									107.7	107.8	108.2	24	107.0	107.8	108.8	24	106.7	107.2	107.8	24	106.3	106.7	107.1	24	08/10
08/11									107.3	107.9	107.8	24	106.7	107.5	108.9	24	106.2	107.1	106.8	24	105.8	106.5	106.8	24	08/11
08/12									106.7	107.3	107.3	24	105.9	106.6	107.7	24	105.1	106.3	105.6	24	104.9	105.9	105.3	24	08/12
08/13									106.6	106.8	107.0	24	105.8	106.6	107.5	24	105.3	105.5	105.7	23	104.9	105.3	105.7	24	08/13
08/14									107.0	107.5	107.6	24	106.1	106.8	108.2	24	106.1	106.5	106.7	21	105.5	106.1	106.5	24	08/14
08/15									107.0	107.4	107.3	24	106.3	107.0	108.3	24	106.6	106.8	107.1	24	106.0	106.3	106.5	24	08/15
08/16									106.7	107.1	107.0	23	106.3	106.9	108.4	23	106.2	106.8	106.6	23	105.9	106.2	106.1	23	08/16

**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	
08/03	106.9	107.9	107.3	23	110.6	110.7	120.7	23	110.2	111.5	111.4	24	112.4	113.7	114.6	23	109.2	109.8	109.9	23	114.4	114.7	116.3	23	08/03
08/04	107.0	107.9	108.7	23	112.0	113.0	120.7	23	108.5	109.7	109.5	24	114.2	115.8	122.8	20	110.0	111.7	115.2	23	114.6	115.8	117.9	20	08/04
08/05	107.0	107.8	108.4	20	108.9	114.0	111.8	20	109.5	110.2	111.5	24	112.3	113.5	114.3	24	109.1	111.6	109.9	24	113.7	115.4	114.6	22	08/05
08/06	107.2	108.2	108.7	24	108.5	109.2	109.6	24	110.8	111.3	113.1	24	112.9	114.8	115.9	24	110.0	111.1	111.5	24	115.2	115.4	116.2	20	08/06
08/07	108.0	108.6	109.1	24	111.8	114.6	119.7	24	111.3	112.6	113.1	24	111.3	115.0	115.4	22	111.2	112.2	112.8	23	115.8	116.1	116.8	22	08/07
08/08	108.0	108.4	109.3	24	112.5	115.1	119.4	24	109.5	110.4	110.2	24	109.0	110.3	110.0	22	108.9	111.9	110.2	23	113.8	115.9	115.3	21	08/08
08/09	108.0	108.7	109.2	23	113.6	116.7	124.1	23	111.8	113.6	114.5	23	111.4	113.1	114.0	22	109.2	110.5	112.9	23	113.9	114.1	115.6	22	08/09
08/10	108.0	108.6	109.2	22	110.4	117.2	116.1	22	113.1	114.5	115.1	21	112.6	113.7	114.2	19	111.6	112.3	113.3	20	115.0	115.4	116.2	20	08/10
08/11	106.5	108.1	107.2	21	109.2	110.5	112.0	21	113.0	114.1	114.7	24	111.8	113.3	115.1	22	111.2	112.8	113.2	24	115.8	117.0	118.2	22	08/11
08/12	105.3	106.2	106.0	24	108.3	109.2	110.3	24	111.1	114.2	113.9	24	110.4	113.8	113.9	24	111.3	112.2	112.9	24	115.8	116.5	117.3	24	08/12
08/13	105.3	106.0	106.5	24	107.7	109.3	109.2	24	107.4	109.8	108.2	24	107.5	109.2	108.9	21	107.7	111.8	109.8	23	112.9	116.1	114.4	20	08/13
08/14	106.0	106.8	107.4	24	108.1	108.8	109.3	24	107.8	108.6	109.2	24	107.2	107.9	109.4	24	106.3	107.4	107.1	24	113.0	113.2	115.3	24	08/14
08/15	106.4	107.1	107.5	24	108.4	108.9	109.4	24	108.5	108.9	109.1	24	108.1	108.6	109.1	24	107.4	108.0	108.2	24	108.8	113.0	113.7	24	08/15
08/16	106.3	106.9	107.5	23	108.3	108.7	109.1	23	107.7	108.5	108.0	23	107.3	108.2	108.3	23	106.2	108.0	107.8	23	107.0	108.1	107.9	22	08/16

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 8/17/2018 7:15:11 AM

Page 2 of 4

**Total Dissolved Gas Data at Upper and Mid-Columbia Sites**

Wanapum				Wanapum Tlwr				Priest Rapids				Priest R. Dnstr				Pasco				Date	
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	Date
08/03	106.1	109.1	107.9	24	112.1	112.3	113.4	24	106.8	109.0	107.5	24	111.3	112.2	114.4	24					08/03
08/04	108.4	110.5	111.5	24	112.8	115.1	124.3	24	108.5	111.3	116.7	24	111.2	112.6	115.1	24					08/04
08/05	110.8	112.3	113.4	24	113.4	114.5	121.5	24	110.8	112.1	115.7	24	111.7	113.0	113.9	24					08/05
08/06	110.7	112.9	113.7	24	112.7	113.5	114.5	24	112.2	112.9	113.1	24	112.7	113.1	114.5	24					08/06
08/07	112.5	113.8	115.3	24	113.4	113.9	115.3	24	111.8	112.5	113.1	24	112.7	113.3	115.1	24					08/07
08/08	113.1	114.6	115.9	24	113.5	113.5	114.9	24	112.7	113.0	113.6	24	112.9	112.9	114.7	24					08/08
08/09	114.3	115.5	116.5	24	113.8	113.8	114.9	24	112.6	113.2	113.6	24	112.9	113.4	113.7	24					08/09
08/10	113.8	115.5	115.2	24	113.6	114.1	115.4	24	113.0	113.4	113.9	24	113.2	113.4	114.6	24					08/10
08/11	109.0	113.7	112.0	24	112.1	113.1	114.1	24	110.5	113.1	112.2	24	111.8	113.2	114.0	24					08/11
08/12	106.9	107.9	108.1	24	111.3	112.5	114.0	24	108.0	109.4	110.1	24	111.2	112.1	113.7	24					08/12
08/13	109.2	111.8	112.6	24	111.7	112.0	113.5	24	110.9	111.2	113.2	24	112.0	112.8	114.1	24					08/13
08/14	112.5	113.5	114.3	24	112.2	112.6	113.5	24	111.2	112.0	113.5	24	112.0	112.3	112.8	24					08/14
08/15	112.9	113.8	114.3	24	112.2	112.6	113.6	24	111.8	112.6	112.7	24	112.4	112.5	112.7	24					08/15
08/16	111.6	113.4	114.3	24	111.1	111.8	112.6	24	111.8	112.5	112.6	24	112.6	113.1	115.3	24					08/16

**Total Dissolved Gas Data at Snake and Clearwater Sites**

Dworshak				Clrwr Peck				Anatone				Clrwr-Lewiston				Lower Granite				Lower G. Tlwr				Date	
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	Date
08/03	108.6	109.1	109.1	24	105.3	107.3	106.5	24	101.4	102.7	104.1	24	105.5	107.8	109.6	24	102.8	103.1	103.1	24	115.6	116.0	117.2	24	08/03
08/04	102.1	108.2	103.0	24	98.9	105.5	103.9	24	101.6	103.1	104.4	24	104.9	107.4	108.3	24	102.4	102.7	102.7	24	116.0	116.4	117.1	24	08/04
08/05	102.0	102.3	102.6	24	96.3	98.2	98.1	24	101.7	103.1	104.4	24	103.7	106.1	107.8	24	102.0	102.5	102.2	24	115.3	116.1	116.0	24	08/05
08/06	105.1	108.2	108.6	24	100.8	104.3	105.7	24	101.8	103.3	104.8	24	103.8	106.2	108.0	24	101.2	101.9	101.4	24	114.7	115.4	115.4	24	08/06
08/07	108.1	108.4	108.7	24	105.2	106.2	106.9	24	102.1	103.6	105.1	24	105.2	107.3	109.0	24	101.6	102.3	102.5	24	115.2	115.4	115.8	24	08/07
08/08	108.5	108.9	109.2	24	106.2	108.5	109.3	24	102.3	103.7	105.1	24	105.5	107.7	109.4	24	102.3	102.4	102.6	24	113.9	115.5	116.4	24	08/08
08/09	109.2	110.1	116.9	24	107.9	109.2	112.5	24	102.4	103.9	105.3	24	105.8	108.2	110.0	24	102.5	102.5	102.8	24	110.9	112.1	111.4	24	08/09
08/10	108.8	109.2	109.6	24	107.9	108.9	109.7	24	102.3	103.5	104.8	24	105.8	107.9	109.5	24	103.0	103.3	103.5	24	111.5	111.7	112.3	24	08/10
08/11	102.5	108.7	103.9	24	103.7	108.4	106.7	24	101.7	103.0	104.2	24	104.8	107.5	107.8	24	102.9	103.3	103.4	24	110.9	111.5	111.3	24	08/11
08/12	101.7	102.3	102.4	24	102.8	104.0	105.0	24	101.2	102.7	104.2	24	103.5	105.7	107.4	24	102.7	103.0	103.2	24	109.4	110.9	111.2	24	08/12
08/13	101.8	102.2	102.5	24	102.6	103.8	104.9	24	101.5	102.9	104.2	24	103.1	105.3	106.7	24	103.0	103.3	103.7	24	112.5	115.7	117.9	24	08/13
08/14	102.2	102.6	102.9	24	102.9	104.1	105.0	24	101.9	103.4	104.9	24	103.3	105.4	107.1	24	102.8	103.3	103.5	24	114.0	116.3	117.3	24	08/14
08/15	102.3	102.6	103.0	24	102.9	104.0	105.0	24	101.8	103.1	104.6	24	103.2	105.2	106.9	24	102.7	103.3	103.7	24	113.0	115.6	117.3	24	08/15
08/16	102.2	102.6	103.1	23	103.0	104.2	105.4	23	101.5	102.7	104.0	23	103.1	105.3	106.8	23	101.6	102.9	102.1	23	113.0	114.9	116.3	23	08/16

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 8/17/2018 7:15:11 AM

Page 3 of 4

**Total Dissolved Gas Data at Lower Snake Sites**

Little Goose				L. Goose Tlwr				Lower Mon.				Lwr. Mon. Tlwr				Ice Harbor				Tlwr Ice Harbor				Date	
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	Date
08/03	110.3	111.6	111.0	24	112.9	114.4	114.7	24	108.6	109.3	109.1	24	116.1	116.2	116.6	24	112.2	113.7	113.2	24	112.6	113.2	113.8	24	08/03
08/04	109.3	110.3	110.2	24	109.6	112.0	110.7	24	108.2	108.6	108.5	24	116.0	116.3	116.7	24	110.9	111.8	111.3	24	112.3	112.9	113.6	24	08/04
08/05	109.0	109.6	110.0	24	109.3	109.8	110.2	24	108.0	108.3	108.5	24	116.2	116.5	116.8	24	110.0	110.7	110.3	24	112.5	113.2	113.7	24	08/05
08/06	107.6	109.0	108.8	24	112.2	114.6	115.3	24	108.1	108.2	108.6	24	114.9	116.2	116.1	24	109.8	109.9	110.0	24	111.8	112.8	113.5	24	08/06
08/07	107.6	107.8	108.1	24	112.7	115.2	116.1	24	108.7	109.4	109.7	24	116.1	116.4	116.6	24	110.7	111.2	111.5	24	113.1	113.7	114.7	24	08/07
08/08	108.3	108.7	109.2	24	112.4	114.4	115.2	24	108.6	109.4	108.9	24	115.3	116.3	116.4	24	112.2	112.7	113.0	24	112.5	113.4	113.9	24	08/08
08/09	108.9	109.2	109.9	24	112.8	114.9	115.6	24	108.6	108.7	108.9	24	115.0	115.4	115.9	24	113.3	113.8	114.3	24	113.3	114.1	114.7	24	08/09
08/10	110.3	110.7	111.9	24	109.6	114.0	110.3	24	109.1	109.2	109.5	24	114.5	115.1	115.6	24	113.7	113.9	114.2	24	112.9	114.0	114.3	24	08/10
08/11	111.5	111.7	112.3	24	109.4	109.7	110.0	24	109.6	109.7	109.9	24	114.4	114.5	114.8	24	113.0	113.9	114.0	24	112.9	113.2	113.6	24	08/11
08/12	109.2	111.1	110.7	24	109.0	109.6	109.8	24	108.9	109.8	110.0	24	112.9	114.7	115.3	24	110.9	112.6	111.7	24	112.4	113.4	114.6	24	08/12
08/13	108.7	109.3	109.7	24	108.7	109.3	109.6	24	108.4	108.7	109.3	24	111.7	113.0	115.1	24	110.6	110.7	111.0	24	110.9	112.0	112.4	24	08/13
08/14	108.4	109.3	109.0	24	108.8	109.3	109.6	24	108.3	109.2	109.5	24	111.8	115.0	115.3	24	110.3	110.9	110.9	24	112.2	112.9	114.0	24	08/14
08/15	107.6	108.5	108.1	24	108.7	109.2	109.6	24	107.1	107.5	107.6	24	113.7	115.2	115.8	24	109.7	110.2	111.2	24	112.3	113.7	114.3	24	08/15
08/16	106.1	107.3	106.7	23	108.4	109.1	109.1	23	107.7	108.0	108.4	23	112.7	114.6	113.4	23	110.3	110.7	111.1	23	111.0	113.2	113.5	22	08/16

**Total Dissolved Gas Data at Mid-Columbia Sites**

McNary-Wash.				Tlwr McNary				John Day				Tlwr John Day				The Dalles				Dnstr T. Dalles				Date	
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	Date
08/03	105.9	108.2	107.7	24	113.6	114.3	114.7	24	105.7	107.0	106.5	24	112.4	113.4	112.8	24	104.8	105.9	105.4	24	110.2	111.3	110.9	24	08/03
08/04	105.5	105.9	106.4	24	113.7	114.3	114.3	24	105.0	105.5	105.7	24	112.9	113.3	113.8	24	104.8	105.8	106.5	24	111.0	111.5	111.9	24	08/04
08/05	105.9	106.1	107.5	24	113.8	114.2	114.8	24	104.8	105.5	105.3	24	112.6	113.3	113.4	24	108.0	108.8	109.2	24	112.3	112.9	113.3	24	08/05
08/06	106.0	106.6	107.2	24	114.3	114.7	115.3	24	104.5	104.8	104.9	24	112.8	113.3	113.7	24	108.6	109.3	109.9	24	113.5	114.5	115.2	24	08/06
08/07	107.3	107.9	110.5	24	114.2	114.8	115.3	24	105.8	106.2	108.0	24	112.5	113.1	113.7	24	108.7	109.1	109.2	24	113.6	114.5	114.5	24	08/07
08/08	109.0	109.8	111.8	24	114.4	115.3	116.4	24	106.2	106.8	107.6	24	112.6	113.1	114.2	24	108.6	109.0	109.6	24	113.8	114.7	115.6	24	08/08
08/09	109.1	110.2	110.7	24	115.1	115.5	116.0	24	106.1	106.7	107.2	24	113.8	114.7	115.1	24	108.2	108.9	108.6	24	113.2	114.6	114.2	24	08/09
08/10	109.9	110.4	111.5	23	115.2	115.5	116.4	23	106.9	107.1	107.7	23	114.5	114.8	115.0	23	107.0	108.1	107.4	23	112.8	113.7	113.5	23	08/10
08/11	107.8	109.4	108.9	24	113.4	115.0	114.8	24	106.0	106.7	106.6	24	113.6	114.2	114.7	24	105.1	106.6	106.1	24	111.0	112.4	111.8	24	08/11
08/12	106.3	107.4	106.9	24	113.0	113.4	113.7	24	106.0	106.4	106.8	24	113.4	113.8	114.4	24	104.9	105.7	106.1	24	110.8	111.8	112.3	24	08/12
08/13	106.2	106.5	107.2	24	113.6	114.1	114.7	24	106.8	107.5	108.8	24	113.6	114.0	114.3	24	108.2	109.7	110.2	24	112.4	113.9	114.7	24	08/13
08/14	105.8	106.5	107.6	24	114.5	115.2	115.7	24	106.7	107.8	108.0	24	114.2	114.9	115.7	24	109.9	110.5	111.2	24	113.9	115.0	115.7	24	08/14
08/15	106.5	106.9	107.2	24	114.7	115.6	116.2	24	106.7	107.0	107.7	24	113.3	114.5	114.8	24	110.5	111.3	123.3	23	113.9	115.0	114.5	24	08/15
08/16	106.5	106.8	107.1	23	114.7	115.5	115.6	23	106.1	106.8	106.7	23	113.7	114.1	114.7	23				0	113.1	114.1	113.7	23	08/16

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 8/17/2018 7:15:11 AM

Page 4 of 4

**Total Dissolved Gas Data at Mid-Columbia Sites**

Date	Bonneville				Warrendale				Camas\Washug.				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	
08/03	103.9	105.0	104.9	24	115.9	116.2	116.6	24	112.7	114.0	115.1	24	114.6	116.4	116.8	24	08/03
08/04	104.5	105.0	105.4	24	116.2	116.3	116.9	24	114.8	116.1	116.8	24	114.7	115.7	116.9	24	08/04
08/05	106.1	107.3	107.8	24	116.1	116.5	117.1	24	115.0	116.2	117.1	24	115.3	116.9	117.2	24	08/05
08/06	108.6	109.6	109.9	24	114.8	116.6	118.2	24	114.2	116.1	117.6	24	115.5	116.2	117.0	24	08/06
08/07	110.1	110.9	111.1	24	115.1	115.4	116.2	24	114.8	116.9	118.4	24	116.9	117.1	117.2	24	08/07
08/08	111.3	112.0	112.2	24	115.4	115.8	116.2	24	116.2	117.3	118.2	24	117.1	117.1	117.3	24	08/08
08/09	111.2	112.0	112.0	24	115.9	116.2	117.0	24	116.1	117.4	117.7	24	115.2	117.1	117.3	24	08/09
08/10	108.5	110.9	109.9	24	116.4	117.5	118.8	24	115.8	117.0	118.3	24	115.4	116.3	117.2	24	08/10
08/11	106.0	108.3	107.2	24	116.7	117.0	117.8	24	111.9	116.6	114.0	24	116.8	116.8	116.9	24	08/11
08/12	105.5	106.1	106.4	24	116.6	116.9	117.3	24	113.9	114.9	115.6	24	114.6	116.8	116.8	24	08/12
08/13	105.9	106.3	107.0	24	116.4	116.8	117.0	24	114.3	115.4	116.4	24	114.1	115.3	117.2	24	08/13
08/14	107.8	108.4	109.0	24	117.3	117.5	118.6	24	114.0	115.3	116.8	24	114.9	115.6	117.5	24	08/14
08/15	110.7	111.7	112.3	24	118.1	118.4	118.8	24	115.9	117.7	119.2	24	117.4	117.5	117.6	24	08/15
08/16	109.8	112.0	112.0	23	116.8	117.8	117.5	23	114.7	117.9	117.0	23	117.1	117.5	117.4	23	08/16

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
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	---	---	---	---	---	---	---	---	---

FISH PASSAGE CENTER

## Smolt Monitoring Program Two Week Passage Index Report

Date 8/17/2018 8:17:03 AM

Page 1 of 7

### 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)
08/03/2018					0	0	0	0	0	0	0
08/04/2018					0	0	0	0			0
08/05/2018					0	0	0	0	0		
08/06/2018					0	0	0	0			0
08/07/2018					0	0	0	0	0	0	
08/08/2018					0	0	0	0			
08/09/2018					0	0	0	0	0		
08/10/2018					0	5	0	0		0	
08/11/2018					0	0	0	0	0		0
08/12/2018					0	0	0	0			
08/13/2018					4	0	0	0	0		0
08/14/2018					0	0	0	0		0	
08/15/2018					0	0	0	0			0
08/16/2018					0	0	0	0			
08/17/2018											
Total:	0	0	0	0	4	5	0	0	0	0	0
# Days:	0	0	0	0	14	14	14	14	6	4	5
Average:	0	0	0	0	0	0	0	0	0	0	0
YTD:	23,452	41,213	21,824	12,792	4,639,017	2,838,053	2,045,317	49,702	1,494,206	1,257,455	1,890,717

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
---	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

FISH PASSAGE CENTER

## Smolt Monitoring Program Two Week Passage Index Report

Date 8/17/2018 8:17:03 AM

Page 2 of 7

### 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)
08/03/2018					1,177	842	33	87	2,368	1,024	
08/04/2018					916	984	75	135			1,133
08/05/2018					537	1,012	184	112	1,225		
08/06/2018					687	448	134	115			1,866
08/07/2018					677	510	228	83	1,702	559	
08/08/2018					771	395	164	81			
08/09/2018					547	478	122	67	572		
08/10/2018					650	449	98	74		57	
08/11/2018					1,027	344	27	99	538		1,194
08/12/2018					581	406	241	50			
08/13/2018					350	346	56	29	602		399
08/14/2018					725	444	92	55		46	
08/15/2018					773	450	46	18			263
08/16/2018					1,465	291	53	24			
08/17/2018											
Total:	0	0	0	0	10,883	7,399	1,553	1,029	7,007	1,686	4,855
# Days:	0	0	0	0	14	14	14	14	6	4	5
Average:	0	0	0	0	777	529	111	74	1,168	422	971
YTD:	0	6	89	192	864,272	935,940	507,465	36,154	2,285,960	1,067,753	2,875,529

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
---	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

FISH PASSAGE CENTER

## Smolt Monitoring Program Two Week Passage Index Report

Date 8/17/2018 8:17:03 AM

Page 3 of 7

### 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)
08/03/2018					0	0	0	1	0	0	
08/04/2018					0	0	0	1			0
08/05/2018					0	0	0	0	0		
08/06/2018					0	7	0	2			0
08/07/2018					0	0	0	0	0	0	
08/08/2018					0	5	9	0			
08/09/2018					0	0	0	0	0		
08/10/2018					0	0	0	1		0	
08/11/2018					0	0	0	6	0		0
08/12/2018					9	0	0	3			
08/13/2018					0	0	0	0	0		0
08/14/2018					11	0	0	0		0	
08/15/2018					0	0	0	1			0
08/16/2018					0	0	0	0			
08/17/2018											
Total:	0	0	0	0	20	12	9	15	0	0	0
# Days:	0	0	0	0	14	14	14	14	6	4	5
Average:	0	0	0	0	1	1	1	1	0	0	0
YTD:	0	0	1,224	1,365	262,520	215,272	42,479	44,218	226,511	120,100	477,464

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
---	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

FISH PASSAGE CENTER

## Smolt Monitoring Program Two Week Passage Index Report

Date 8/17/2018 8:17:03 AM

Page 4 of 7

### 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)
08/03/2018					9	3	0	0	0	0	
08/04/2018					0	3	0	0			0
08/05/2018					0	9	0	0	0		
08/06/2018					0	0	0	0			0
08/07/2018					4	5	0	0	0	0	
08/08/2018					0	5	0	0			
08/09/2018					4	5	0	0	0		
08/10/2018					0	0	0	0		7	
08/11/2018					4	6	0	0	0		0
08/12/2018					0	0	9	0			
08/13/2018					0	0	0	1	0		0
08/14/2018					6	0	0	0		0	
08/15/2018					0	0	0	1			0
08/16/2018					0	0	0	0			
08/17/2018											
Total:	0	0	0	0	27	36	9	2	0	7	0
# Days:	0	0	0	0	14	14	14	14	6	4	5
Average:	0	0	0	0	2	3	1	0	0	2	0
YTD:	723	27,448	3,888	5,328	3,924,758	3,004,330	1,942,814	24,915	240,968	681,274	356,557

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
---	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----



FISH PASSAGE CENTER

## Smolt Monitoring Program Two Week Passage Index Report

Date 8/17/2018 8:17:03 AM

Page 5 of 7

### 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)
08/03/2018					0	0	0	0	0	7	
08/04/2018					0	0	0	0			0
08/05/2018					0	0	0	0	0		
08/06/2018					0	0	0	0			0
08/07/2018					0	0	0	0	0	7	
08/08/2018					0	0	0	0			
08/09/2018					0	0	0	0	0		
08/10/2018					0	0	0	0		0	
08/11/2018					0	0	0	0	0		0
08/12/2018					0	0	0	0			
08/13/2018					0	0	0	1	0		0
08/14/2018					0	0	0	0		0	
08/15/2018					0	0	0	0			0
08/16/2018					0	0	0	0			
08/17/2018											
<b>Total:</b>	0	0	0	0	0	0	0	1	0	14	0
<b># Days:</b>	0	0	0	0	0	0	0	0	0	4	0
<b>Average:</b>	0	0	0	0	0	0	0	0	0	4	0
<b>YTD:</b>	0	0	4	115	260,629	120,859	58,625	76,235	1,527,701	383,716	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
---	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

FISH PASSAGE CENTER

## Smolt Monitoring Program Two Week Passage Index Report

Date 8/17/2018 8:17:03 AM

Page 6 of 7

### 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)
08/03/2018					1	6	0	1	0	0	
08/04/2018					0	10	0	0			0
08/05/2018					4	8	8	1	0		
08/06/2018					3	4	4	0			2
08/07/2018					0	8	0	0	4	0	
08/08/2018					3	2	0	0			
08/09/2018					4	6	0	0	4		
08/10/2018					0	8	0	0		0	
08/11/2018					0	8	4	0	12		0
08/12/2018					3	24	4	0			
08/13/2018					0	10	0	0	8		0
08/14/2018					4	6	0	0		0	
08/15/2018					0	3	1	0			0
08/16/2018					0	5	3	0			
08/17/2018											
Total:	0	0	0	0	22	108	24	2	28	0	2
# Days:	0	0	0	0	16	20	15	14	6	4	5
Average:	0	0	0	0	1	5	2	0	5	0	0
YTD:		1	3		490	35,897	56,812	370	219,210	227,728	27,305

- 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
---	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

FISH PASSAGE CENTER

## Smolt Monitoring Program Two Week Passage Index Report

Date 8/17/2018 8:17:03 AM

Page 7 of 7

**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:**

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

**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  $\text{Passage Index} = \text{Collection Counts} / (\text{Powerhouse Flow} / (\text{Powerhouse Flow} + \text{Spill}))$   
 RIS, BO2 (Index) = Rock Island Dam Second Powerhouse Bypass Trap : Passage Index Counts  $\text{Passage Index} = \text{Collection Counts} / (\text{Powerhouse 2 Flow} / (\text{Powerhouse 1 \& 2 Flow} + \text{Spill}))$
- 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

### 8/3/2018 12:00:00 AM TO 8/17/2018 12:00:00 AM

Date 8/17/2018 7:17:39 AM

Page 1 of 2

#### Lower Granite Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	4,557	2	8	0	12	4,591
Sum of Number Barged	3,786	2	8	0	11	3,818
Sum of Number Bypassed	0	0	0	0	0	0
Sum of Number Trucked	736	0	0	0	0	736
Sum of Sample Morts	25	0	0	0	0	25
Sum of Facility Morts	10	0	0	0	1	12
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	35	0	0	0	1	37

#### Little Goose Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	4,392	2	6	0	20	4,440
Sum of Number Barged	3,880	0	5	0	20	3,925
Sum of Number Bypassed	0	0	0	0	0	0
Sum of Number Trucked	471	0	0	0	0	471
Sum of Sample Morts	17	1	1	0	0	19
Sum of Facility Morts	24	1	0	0	0	25
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	41	2	1	0	0	44

FISH PASSAGE CENTER

## Two Week Transportation Summary Report 8/3/2018 12:00:00 AM TO 8/17/2018 12:00:00 AM

Date 8/17/2018 7:17:39 AM

Page 2 of 2

### Lower Monumental Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	724	0	4	0	4	736
Sum of Number Barged	669	0	3	0	4	680
Sum of Number Bypassed	0	0	0	0	0	0
Sum of Number Trucked	51	0	0	0	0	51
Sum of Sample Morts	1	0	0	0	0	1
Sum of Facility Morts	3	0	1	0	0	4
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	4	0	1	0	0	5

### Total

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	9,673	4	18	0	36	9,767
Sum of Number Barged	8,335	2	16	0	35	8,423
Sum of Number Bypassed	0	0	0	0	0	0
Sum of Number Trucked	1,258	0	0	0	0	1,258
Sum of Sample Morts	43	1	1	0	0	45
Sum of Facility Morts	37	1	1	0	1	41
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	80	2	2	0	1	86

FISH PASSAGE CENTER

## YTD Transportation Summary Report

Date 8/17/2018 7:17:16 AM

Page 1 of 2

### Lower Granite Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	525346	3041145	182820	188701	2522940	8983892
Sum of Number Barged	508800	2429169	179217	184065	1811318	6923887
Sum of Number Bypassed	14636	610813	3539	4465	711353	2056159
Sum of Number Trucked	736	0	0	0	0	736
Sum of Sample Morts	215	58	0	9	44	370
Sum of Facility Morts	934	1063	64	162	190	2603
Sum of Reseach Morts	25	42	0	0	35	137
Sum of Total Project Mort	1174	1163	64	171	269	3110

### Little Goose Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	564677	1857033	137100	74669	1969529	6572537
Sum of Number Barged	559195	1546147	136377	66134	1357466	5022785
Sum of Number Bypassed	854	306206	407	7716	611659	1538501
Sum of Number Trucked	471	0	0	0	0	471
Sum of Sample Morts	142	41	4	13	14	228
Sum of Facility Morts	4015	4639	312	806	390	10552
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	4157	4680	316	819	404	10780

FISH PASSAGE CENTER

## YTD Transportation Summary Report

Date 8/17/2018 7:17:16 AM

Page 2 of 2

### Lower Monumental Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	304854	1218103	24944	35305	1178564	3940334
Sum of Number Barged	304570	1018208	24840	33659	926249	3233775
Sum of Number Bypassed	0	199433	100	1598	252167	705465
Sum of Number Trucked	51	0	0	0	0	51
Sum of Sample Morts	14	7	0	3	7	38
Sum of Facility Morts	219	455	4	45	141	1005
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	233	462	4	48	148	1043

### Total

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	1394877	6116281	344864	298675	5671033	19496763
Sum of Number Barged	1372565	4993524	340434	283858	4095033	15180447
Sum of Number Bypassed	15490	1116452	4046	13779	1575179	4300125
Sum of Number Trucked	1258	0	0	0	0	1258
Sum of Sample Morts	371	106	4	25	65	636
Sum of Facility Morts	5168	6157	380	1013	721	14160
Sum of Reseach Morts	25	42	0	0	35	137
Sum of Total Project Mort	5564	6305	384	1038	821	14933

**Cumulative Adult Passage at Mainstem Dams Through: 08/16**

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	08/16	87894	6456	83624	18110	152393	25835	61057	4349	88044	10648	101791	21805	5174	746	6099	754	12878	2308
TDA	08/16	57935	4793	58310	12497	119227	21697	49296	3787	69246	9277	84539	17568	2395	384	2547	409	7066	1447
JDA	08/16	50572	5053	46675	12475	103731	20380	42835	4293	60416	7363	75555	16777	996	242	972	234	4005	934
MCN	08/16	44427	3472	44292	7020	94405	16297	42649	2513	57279	4705	71705	12468	557	102	619	81	2838	496
IHR	08/16	32600	2197	28306	6949	68113	11204	6046	521	9284	2087	19109	4826	103	6	71	12	467	58
LMN	08/16	35398	3020	28545	8270	68100	11017	6091	716	8216	3388	19658	6010	48	8	65	19	280	47
LGS	08/16	31834	2486	26598	8335	63992	12109	7458	589	9086	3754	19425	6430	22	1	10	6	91	10
LGR	08/16	31161	2948	27357	8256	62850	13009	7286	819	8936	3621	17340	6857	0	0	0	0	0	0
PRD	08/15	7067	949	7268	783	18018	1858	40076	2269	52981	1760	60015	3091	103	41	176	43	612	228
WAN	08/15	8071	964	6612	484	17542	2163	37808	1450	49392	1355	56843	2474	111	70	170	30	516	141
RIS	08/15	7894	997	8080	564	18255	2598	38681	1620	56095	1264	59106	4825	0	0	0	0	0	0
RRH	08/15	5919	807	5864	406	8195	1153	32852	1061	42266	961	46783	3209	0	0	0	0	0	0
WEL	08/15	7500	976	6589	820	8670	1609	21318	989	28946	990	35043	3009	0	0	0	0	0	0
WFA	08/15	24543	1999	34186	2442	35770	1705	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.	
BON	08/16	122	21	8	0	275	75	193774	87628	321892	51137	39195	176005	21483	18056	71510	40547	78890	27693	
TDA	08/16	8	0	0	0	21	5	151943	63923	273579	14391	9107	80316	6862	4766	36973	9436	27279	7901	
JDA	08/16	3	5	0	0	7	5	168367	65865	264592	7989	4673	55151	4598	3064	24931	7628	19556	5831	
MCN	08/16	-4	0	0	0	1	0	155394	57948	230272	6931	5544	42010	3659	2569	17776	1290	1852	895	
IHR	08/16	-1	0	0	0	0	0	656	392	959	3781	2362	23444	1570	1213	7743	835	985	336	
LMN	08/16	0	0	0	0	0	0	391	345	1118	4013	2799	24850	1799	1539	9045	326	311	93	
LGS	08/16	0	0	0	0	0	0	260	285	1046	2844	2048	14251	1194	1040	6306	106	416	73	
LGR	08/16	0	0	1	0	0	0	272	226	1075	6078	7749	15365	2105	3347	6540	170	279	33	
PRD	08/15	0	0	0	0	0	0	189845	66647	270951	1311	804	5266	0	0	0	8980	17728	3771	
WAN	08/15	0	0	0	0	0	0	196149	76063	241526	1258	691	5322	0	0	0	5400	14716	2580	
RIS	08/15	0	0	0	0	0	0	171754	73105	263634	1235	698	3846	696	434	1968	2817	8416	1211	
RRH	08/15	0	0	0	0	0	0	162455	46632	220499	838	440	2732	443	215	1299	2950	9154	1235	
WEL	08/15	0	0	0	0	0	0	153270	42204	208992	635	340	1394	323	206	678	152	34	0	
WFA	08/15	0	2	117	117	5	12	0	0	0	10458	2683	20498	2114	742	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.



