



# Fish Passage Center

## Weekly Report #19-05

April 5, 2019

### This Week's Highlights

#### Water Supply

Precipitation throughout the Columbia Basin has varied between 11% and 156% of average at individual sub-basins so far in April. Precipitation above The Dalles has been 49% of over the first week of April. Over the 2019 water year, precipitation has ranged between 66% and 89% of average.

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

Location	Water Year 2019 April 1-4, 2019		Water Year 2019 October 1, 2018 to April 4, 2019	
	Observed (inches)	% Average	Observed (inches)	% Average
	Columbia Above Coulee	0.09	24	16.8
Snake River Above Ice Harbor	0.19	65	12.5	89
Columbia Above The Dalles	0.15	49	13.7	79
Kootenai	0.11	30	15.1	66
Clark Fork	0.04	11	13.4	86
Flathead	0.07	19	14.7	70
Pend Oreille River Basin above Waneta Dam	0.07	20	14.6	75
Salmon River Basin	0.11	30	15.7	89
Upper Snake Tributaries	0.28	86	13.4	84
Clearwater	0.16	34	20.6	78
Willamette River above Portland	1.13	156	38.3	76

Snowpack within the Columbia Basin has been variable. Average snowpack in the Columbia River for basins above the Snake River confluence is 87% of average, for Snake River Basins the average snowpack is 122% of average, and for lower Columbia Basins between

McNary and Bonneville Dam average snowpack is 126% of average.

Table 2 displays the April 4<sup>th</sup> ESP runoff volume forecasts for multiple reservoirs along with the April COE forecasts at Libby and Dworshak. The April 4<sup>th</sup> ESP forecast at The Dalles between April and August is 74,895 Kaf (86% of average).

**Table 2. April 4 ESP Runoff Volume Forecasts for various reservoirs within the Columbia and Snake River Basins.**

Location	April 4, 2019 5-day QPF ESP	
	% Average (1981-2010)	Runoff Volume (Kaf)
The Dalles (Apr-Aug)	86	74,895
Grand Coulee (Apr-Aug)	81	46,223
Libby Res. Inflow, MT (Apr-Aug)	72 81**	4,262 4,752**
Hungry Horse Res. Inflow, MT (Apr-Aug)	79	1,520
Lower Granite Res. Inflow (Apr- July)	96	20,313
Brownlee Res. Inflow (Apr-July)	103	6495
Dworshak Res. Inflow (Apr-July)	84 81**	2,111 1,964**

\*\*COE April Final Forecast

Grand Coulee Reservoir is at 1259.9 feet (04-04-19)

and has refilled 0.9 feet over the last week. Outflows at Grand Coulee have ranged between 52.3 Kcfs and 63.9 Kcfs over the last week. The April 10<sup>th</sup> Flood Control Elevation at Grand Coulee is 1283.3 feet (based on March Final Forecast).

The Libby Reservoir is currently at elevation 2405.8 feet (04-04-19) and has held steady over the past week. Daily average outflows at Libby Dam have been 4.0 Kcfs over the last week. The April 10<sup>th</sup> Flood Control Elevation at Libby is 2441.3 feet (based on March Final Forecast).

Hungry Horse is currently at an elevation of 3520.9 feet (04-04-19) and refilled 0.2 feet over the last week. Outflows at Hungry Horse have been 1.2 – 1.5 Kcfs over the last week. The April 10<sup>th</sup> Flood Control Elevation at Hungry Horse is 3544.6 feet (based on March Final Forecast).

Dworshak is currently at an elevation of 1532.5 feet (04-04-19) and has refilled 2.6 feet over last week. Dworshak outflows have been 5.0 – 5.5 Kcfs. The April 10<sup>th</sup> System Flood Control Elevation at Dworshak is 1559.5 feet, the April 10<sup>th</sup> Local FC Elevation is 1570.5 feet (based on March Final Forecast).

The Brownlee Reservoir was at an elevation of 2045.0 feet on April 4, 2019 and has refilled 8.0 feet in the last week. Outflows at Hells Canyon have ranged between 19.3 and 29.8 Kcfs over the last four days. The April 10<sup>th</sup> Flood Control Elevation at Brownlee is 2053.5 feet (based on March Final Forecast).

### Spill

Flows in the Snake, Upper Columbia, and Mid-Columbia this week have been similar to the previous week. Daily average flows at Lower Granite Dam, Rock Island, and McNary dams have ranged from 60.2-78.3 Kcfs, 55.9-69.2 Kcfs, and 128.2-168.6 Kcfs, respectively.

In December of 2018, the Action Agencies (Bonneville Power Administration, the U.S. Army Corps of Engineers, and the U.S. Bureau of Reclamation) signed an agreement with the states of Oregon and Washington and the Nez Perce Tribe for 2019-2021 Spill Operations. The spill operations under this agreement are often referred to as “Flex Spill”. In accordance with the 2019-2021 Spill Operations Agreement, the

2019 Fish Operations Plan (FOP) specifies that spring spill operations on the Snake and Mid-Columbia rivers will be to spill to the 120% spill caps at all eight projects for sixteen hours per day and “performance standard” spill for eight hours per day. The eight hours of “performance standard” spill will occur in up to two blocks per calendar day, an am block and a pm block. The timing and duration of each “performance standard” block is flexible and may change between days. The spring spill operations specified by the 2019 FOP are summarized in Table 3.

**Table 3. 2019 Spring spill operations at Snake and Mid-Columbia projects under Flex Spill Agreement.**

Project	Dates	Gas Cap Spill (16 hours per day)	Performance Standard Spill (8 hours per day)
Lower Granite	Apr. 3-June 20	120% Gas Cap	20 Kcfs
Little Goose	Apr. 3-June 20	120% Gas Cap	30%
Lower Monumental	Apr. 3-June 20	120% Gas Cap	30 Kcfs (bulk pattern)
Ice Harbor	Apr. 3-June 20	120% Gas Cap	30%
McNary	Apr. 10-June 15	120% Gas Cap	48%
John Day	Apr. 10-June 15	120% Gas Cap	32%
The Dalles	Apr. 10-June 15	120% Gas Cap	40%
Bonneville	Apr. 10-June 15	120% Gas Cap	100 Kcfs

**Note:** For the Flex Spill Agreement, the State of Washington made two modifications to their TDG waiver. First, the requirement to not exceed 115% TDG in the downstream forebay has been eliminated. Therefore, TDG will only be managed to 120% in the tailrace. Second, the methodology of calculating the 12-hour average TDG has been changed to align with the State of Oregon’s methodology. This means that the 12-hour average TDG is based on the 12 highest hourly TDG measurements in a single calendar day (not necessarily consecutive). These modifications only apply to the spring spill season. When summer spill begins in June, the State of Washington’s 115% forebay TDG requirement will be reinitiated and the Washington methodology of calculating the 12-hour average based on rolling average will be re-implemented. The COE will estimate 120% TDG spill caps (tailrace only) for each project on a daily basis and projects

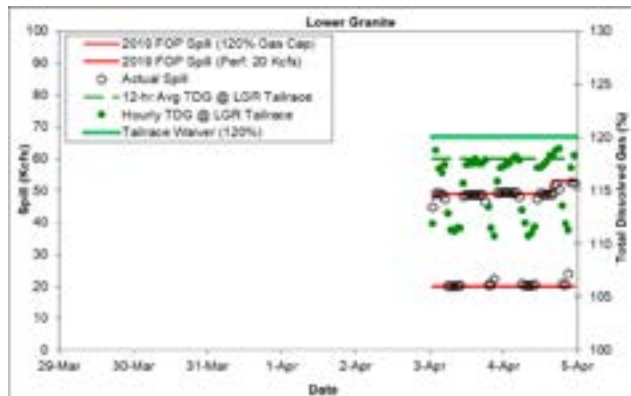
will be operated to these estimated spill caps for the 16-hours of gas cap spill. Daily spill caps are published on the TMT website (<http://pweb.crohms.org/tmt/documents/ops/spill/caps/>). The 2019 spill for fish passage program at the lower Snake River projects began just after midnight on April 3<sup>rd</sup>. Spill for fish passage is expected to begin at the Mid-Columbia River projects just after midnight on April 10<sup>th</sup>. The daily 120% spill caps at Snake River projects for the first two days of fish spill (April 3-4) are summarized in Table 4.

**Table 4. 120% TDG spill caps at Snake River projects. Estimated spill caps are for most recent week of spill operations.**

Project	120% Spill Caps (4/3-4/4)
Lower Granite	49-53 Kcfs
Little Goose	52 Kcfs
Lower Monumental	51 Kcfs
Ice Harbor	93 Kcfs

**Spill Summary**

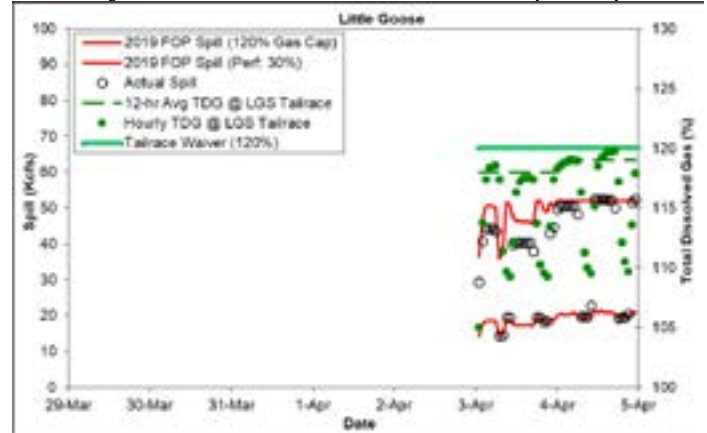
The 120% spill caps at Lower Granite Dam (LGR) started at 49 Kcfs on April 3<sup>rd</sup> but were increased to 53 Kcfs on the afternoon of April 4<sup>th</sup>. Spill at LGR met the estimated 120% spill cap levels for approximately 16 hours and the “performance standard” spill levels (20 Kcfs) for 8 hours on each of April 3<sup>rd</sup> and 4<sup>th</sup> (Figure 1). However, hourly TDG levels during the 16 hours of gas cap spill were below 120% and the 12-hour average TDG for both April 3<sup>rd</sup> and April 4<sup>th</sup> were 118%, indicating that the 120% spill caps could be increased further.



**Figure 1.** Hourly spill and TDG at Lower Granite Dam (Apr. 3-4, 2019).

The 120% spill cap at Little Goose Dam (LGS) was 52 Kcfs on both April 3<sup>rd</sup> and April 4<sup>th</sup>. Spill at LGS did not meet the estimated 120% spill cap of 52 Kcfs on April 3<sup>rd</sup> but did meet the “performance standard” spill level of 30% (Figure 2). The reason spill did not

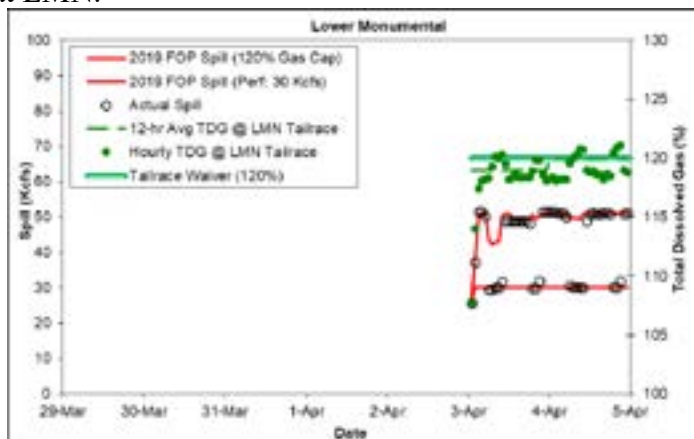
meet the estimated spill cap of 52 Kcfs on April 3<sup>rd</sup> was because flows were sufficiently low to not allow for it. Instead, spill at LGS during the Gas Cap hours was everything in excess of powerhouse minimum requirements. Spill on April 4<sup>th</sup> met the estimated 120% spill caps levels for 16 hours and the “performance spill” levels (30%) for eight hours (Figure 2). However, hourly TDG levels in the LGS tailrace were generally below 120% during the gas cap spill operation and the 12-hour average for April 4<sup>th</sup> was 119%, indicating that there may be room to increase the 120% spill cap.



**Figure 2.** Hourly spill and TDG at Little Goose Dam (Apr. 3-4, 2019).

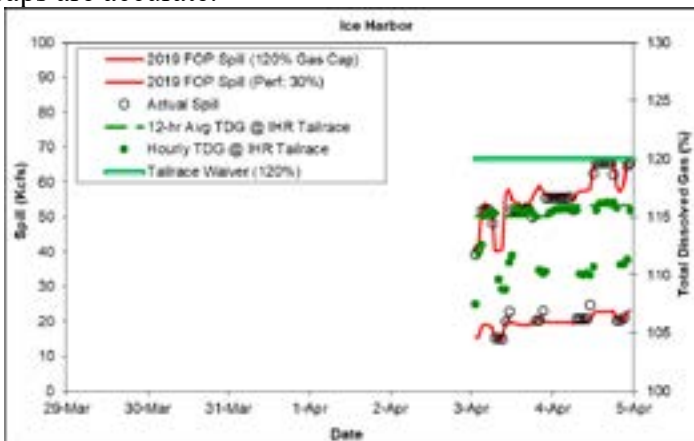
The 120% spill cap at Lower Monumental Dam (LMN) was 51 Kcfs on both April 3<sup>rd</sup> and April 4<sup>th</sup>. Spill at LMN did not meet the estimated 120% spill cap of 51 Kcfs for all 16 hours on April 3<sup>rd</sup> but did meet the “performance standard” spill level of 30 Kcfs for eight hours (Figure 3). The reason spill did not meet the estimated spill cap of 51 Kcfs for all 16 hours on April 3<sup>rd</sup> was because some hourly flows were sufficiently low to not allow for it. Instead, spill at LMN during these Gas Cap hours was everything in excess of powerhouse minimum requirements. Spill on April 4<sup>th</sup> met the estimated 120% spill caps levels for 16 hours and the “performance spill” levels (30 Kcfs) for eight hours (Figure 3). Hourly TDG levels that resulted from the two different operations at LMN (gas cap vs. “performance standard”) were counter to what one might expect. The “performance standard” spill of 30 Kcfs resulted in higher TDG levels than the spill to the 120% gas cap (Figure 3). This is because the “performance standard” spill uses a bulk spill pattern, which has been known to produce higher TDG levels than the uniform spill pattern (see [SOR 2011-02](#), [SOR 2014-01](#), [SOR 2016-1A](#), and [SOR 2016-1B](#)), which is what is being used during the gas cap spill operation.

Therefore, the bulk spill pattern that is used for the “performance standard” spill operation may begin to limit what is possible during the gas cap spill operation at LMN.



**Figure 3.** Hourly spill and TDG at Lower Monumental Dam (Apr. 3-4, 2019).

The 120% spill cap at Ice Harbor Dam (IHR) was 93 Kcfs on both April 3<sup>rd</sup> and April 4<sup>th</sup>. Spill at IHR did not meet the estimated 120% spill cap of 93 Kcfs on April 3<sup>rd</sup> or April 4<sup>th</sup> but did meet the “performance standard” spill level of 30% for eight hours on both days (Figure 4). The reason spill did not meet the estimated spill cap of 93 Kcfs during the Gas Cap spill operation was because hourly flows were sufficiently low to not allow for it. Instead, spill at IHR during the Gas Cap hours was everything in excess of powerhouse minimum requirements. Given that low flows have prohibited the Gas Cap operation from being accomplished to date, it is difficult to determine whether the current 120% spill caps are accurate.



**Figure 4.** Hourly spill and TDG at Ice Harbor Dam (Apr. 3-4, 2019).

Spill for fish passage in the Mid-Columbia River is not expected to begin until just after midnight on April 10<sup>th</sup>. However, there has been some involuntary spill

(i.e., spill outside of fish passage season) at The Dalles Dam this week. From March 31<sup>st</sup> to April 2<sup>nd</sup>, The Dalles Dam spilled approximately 15 Kcfs for 12-hours each day (0700 to 1800). This spill was provided as attraction flow to the North adult fish ladder until repairs to the East Ladder axillary water supply system were finished on the afternoon of April 2<sup>nd</sup>.

### **Gas Bubble Trauma Monitoring**

Training for the Gas Bubble Trauma (GBT) monitoring program in smolts took place this week. So far, only one GBT sample has been conducted for the 2019 season. No fish were observed with signs of GBT in the sample from LGR this week. Gas bubble trauma monitoring at all other Snake River projects is expected to begin over the next week, pending sample size requirements can be met. Sampling at Mid-Columbia and Upper Columbia projects is expected to begin on or after April 10<sup>th</sup>, when the spring spill season officially begins. 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.

### **Temperature**

Forebay temperatures are now being reported for Lower Granite, Ice Harbor, McNary and Bonneville dams. Thus far, reported temperatures are close to the current 10-year averages at Bonneville, Ice Harbor, and Lower Granite dams. Current temperatures in the McNary forebay are slightly above the current 10-year average for this time of year.

### **Smolt Monitoring**

The Smolt Monitoring Program (SMP) is currently collecting and reporting data from six bypass facilities: Bonneville Dam, John Day Dam, Rock Island Dam, Lower Granite Dam, Little Goose Dam, and Lower Monumental Dam. In addition, the SMP is currently receiving data from all four of our mainstem traps: the Salmon River Trap, the Snake River Trap, the Grande Ronde River Trap, and the Imnaha River Trap. SMP sampling activities at McNary Dam began yesterday. Data from the first sample at MCN are expected to be submitted to the FPC later today.

Subyearling Chinook continued to dominate the

samples at Bonneville Dam (BON) this week. Nearly all (99.8%) of the subyearling Chinook sampled at BON this week were fry. The daily average passage index for subyearling Chinook fry this week was approximately 2,600 per day, which is an increase over last week's daily average passage index of nearly 1,800. Yearling Chinook and coho passage also increased this week, when compared to the previous week. This week's daily average passage indices for yearling Chinook and coho were 260 and 430 per day, respectively. Last week's daily average passage indices for these two species were both less than 50 per day. Unlike previous weeks, very few (<1%) of the coho that were collected this week were fry. Steelhead and sockeye were also encountered in this week's collections, but in relatively small numbers. Pacific lamprey macrophthalmia were encountered in all seven samples this week. This week's daily average collection for Pacific lamprey macrophthalmia was nearly 200 per day, which is similar to last week's daily average collection. Pacific lamprey ammocoetes were encountered in two of this week's samples (March 29<sup>th</sup> and 30<sup>th</sup>).

Similar to the last few years, sampling at John Day Dam (JDA) is every-other-day. Yearling Chinook continued to dominate the salmonid samples at JDA this week. This week's daily average passage index for yearling Chinook was about 1,300 per day, which is a large increase over last week's daily average passage index of only 130 per day. Of the yearling Chinook collected this week, approximately 9% were yearling fall Chinook holdovers. The only other salmonids that were encountered in this week's samples were subyearling Chinook and steelhead, which were encountered in low numbers. Pacific lamprey macrophthalmia were encountered in all three of this week's samples, with a daily average collection of about 1,100 per day. Pacific lamprey ammocoetes were also encountered in all three of this week's samples. This week's daily average collection for Pacific lamprey ammocoetes was nearly 100 per day.

Yearling Chinook and steelhead continued to dominate the samples at Lower Granite Dam (LGR) this week. This week's daily average passage indices for these two species were nearly 16,200 and approximately 14,750 per day, respectively. Both of these were increases over last week's daily average passage indices of 2,500 yearling Chinook and 3,750 steelhead. Of the yearling Chinook sampled this week,

approximately 9% were yearling fall Chinook. Of the steelhead sampled this week, approximately 92% were of hatchery origin. Subyearling Chinook and coho were also encountered in this week's samples at LGR. This week's daily average passage indices for these two species were nearly 1,000 and 525 per day, respectively. All of the subyearling Chinook sampled at LGR this week were fry. Sockeye were also encountered in this week's samples but only once (March 30<sup>th</sup>) and in very low numbers. Finally, both Pacific lamprey macrophthalmia and ammocoetes were encountered this week. Macrophthalmia were encountered in four of this week's samples while ammocoetes were encountered in two samples.

Sampling at Little Goose Dam (LGS) began on April 1<sup>st</sup>, with the first sample being tallied and reported on April 2<sup>nd</sup>. Sampling at LGS will occur every-other-day until the start of transportation, at which time daily sampling will begin. Steelhead dominated the first two samples at LGS, followed by yearling Chinook. Subyearling Chinook and sockeye were also encountered in this week's samples but in relatively small numbers. Finally, Pacific lamprey macrophthalmia were encountered in both of this week's samples, with a daily average collection of 185 per day.

Similar to LGS, sampling at Lower Monumental Dam (LMN) will also occur every-other-day until the start of transportation, at which time daily sampling will begin. Yearling Chinook continued to dominate the samples at LMN this week. This week's daily average passage index for yearling Chinook at LMN was about 7,200 per day, which is a large decrease from last week's daily average passage index of approximately 24,000 per day. This large decrease in yearling Chinook passage likely indicates that the emergency release of yearling fall Chinook from Lyons Ferry Hatchery on March 11<sup>th</sup> has mostly passed LMN by now. However, Lyons Ferry Hatchery fall Chinook still made up a substantial portion (92%) of the yearling Chinook encountered in this week's samples. Steelhead passage increased this week, when compared to the previous week. This week's daily average passage index for steelhead at LMN was about 1,700 per day, whereas that for last week was about 600 per day. No other salmonids were encountered in this week's samples at LMN. Finally, Pacific lamprey macrophthalmia were encountered in three of this week's four samples. This week's daily average collection for macrophthalmia at

LMN was 740 per day.

Sampling at Rock Island Dam (RIS) began on March 31<sup>st</sup>, with the first sample being tallied and reported on April 1<sup>st</sup>. Subyearling Chinook and yearling Chinook were the only salmonids encountered in this week's samples. The daily average passage index for subyearling Chinook this week was about 60 per day. All of the subyearling Chinook that were collected this week were fry. Passage indices estimates for yearling Chinook were very low this week, ranging from 0 to seven in each of the first four samples. Finally, Pacific lamprey macrophthalmia were collected in each of this week's four samples but no ammocoetes were collected this week.

The Snake River Trap at Lewiston, ID (LEW) is located at river kilometer 225 of the Snake River and is operated by Idaho Department of Fish and Game. This week's samples at LEW consisted of subyearling Chinook fry (16 total), yearling Chinook (35 total), coho (19 total), and steelhead (211 total). Of the yearling Chinook collected this week, zero were yearling fall Chinook holdovers and approximately 74% were of hatchery origin. Of the steelhead collected this week, approximately 93% were of hatchery origin. In order to reduce handling of hatchery yearling fall Chinook that are planned for release upstream of the trap, sampling at LEW was suspended after yesterday's (April 4<sup>th</sup>) sample. Sampling will resume on Sunday (April 7<sup>th</sup>), with data from this sample enumerated and transmitted to the FPC on Monday (April 8<sup>th</sup>).

The Grande Ronde Trap (GRN) is located at river kilometer 002 of the Grande Ronde River and is operated by the Oregon Department of Fish and Wildlife. This week's samples of salmonids at GRN consisted of yearling Chinook (347 total), steelhead (371 total), coho (31 total), and subyearling Chinook fry (4 total). In addition, 14 total Pacific lamprey ammocoetes and 2 total Pacific lamprey macrophthalmia were encountered in this week's samples.

The Salmon River Trap at Whitebird (WTB) is located at river kilometer 103 of the Salmon River and is operated by Idaho Department of Fish and Game. Similar to recent years, sampling at WTB in 2019 will only occur on weekdays. Yearling Chinook continued to dominate the collections at WTB this week. This week's daily average collection for yearling Chinook was about 380 per day, which is a decrease from last week's daily average collection of about 880 per day.

The majority (90%) of the yearling Chinook in this week's samples were of hatchery origin and likely from the recent releases of yearling spring Chinook from Rapid River Hatchery. The only other salmonids that were encountered in this week's samples at WTB were steelhead, which consisted of one steelhead in each of the April 2 and April 4 samples.

The Imnaha River Trap (IMN) is located at river kilometer 007 of the Imnaha River and is operated by the Nez Perce Tribe. Sampling at the Imnaha River Trap is year round. For 2019, the FPC currently has data from IMN for the period of February 15<sup>th</sup> through April 2<sup>nd</sup>. Salmonid collections over the last week of available data (March 26-April 2) consisted of yearling Chinook (268 total) and steelhead (321 total). Of the yearling Chinook that were collected over this last week, approximately 28% were of known hatchery origin. Unlike previous weeks, a substantial portion (68%) of this week's steelhead collection was of hatchery origin. Finally, Pacific lamprey ammocoetes (13 total) were collected at IMN over this last week. The ammocoetes were encountered in the samples from March 28<sup>th</sup> through March 30<sup>th</sup>.

### **Hatchery Releases**

FPC has not received preliminary data from some hatcheries as of 04/05/19, 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. Approximately 1.66 million spring Chinook were scheduled to be released into this zone over the last week. Of these 50% are volitional releases at Kooskia Hatchery that started March 18<sup>th</sup>. The rest were scheduled to be released into the Grand Ronde River at Lookingglass Creek (250,000), Imnaha River (280,000), and Tucannon River (150,000). Another 288,000 summer Chinook were also planned for release into the Salmon River at Johnson Creek (127,000), and the South Fork Salmon (160,000). Additionally, there were over 6.9 million summer steelhead planned for release in this zone over the past week. Approximately 43% were scheduled to be released into the Salmon River and

Pahsimeroi Rivers, with 1.58 million being released voluntarily through the end of the month. Another 44% of these are scheduled for Clearwater River releases, at Dworshak Hatchery, Clear Creek, and the South Fork of the Clearwater. The remainder are accounted for by releases into Tucannon River (104,000), Wallowa River (320,000), Imnaha River (215,000), and the Grand Ronde (227,000). Finally, there were two releases of yearling fall Chinook to the Snake River over the last week, 160,000 at Captain John Acclimation pond, and another 449,000 at Lyons Ferry Hatchery.

In the next two weeks, approximately 1.49 million spring and summer Chinook are planned for release into this zone. The majority of these (56%) are being released into the Pahsimeroi River, a tributary of the Salmon. The remaining releases are scheduled for the Wallowa (250,000), and Grande Ronde Rivers (400,000). There will also be approximately 3.26 million summer steelhead planned for release over the next two weeks. Most of these will be into the Salmon River and its tributaries; Little Salmon (394,000), Yankee Fork (616,000), Pahsimeroi (1,050,000), and at the Sawtooth Hatchery (282,000). Releases in the Pahsimeroi release began on April 1<sup>st</sup> and will continue through the middle of the April. The remaining fish are planned for release into the South Fork Clearwater (473,000) and Newsome Creek (124,000), and the Wallowa (320,000).

### **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. Over the past week, there were approximately 1.69 million spring and summer Chinook scheduled for release into this zone. Of these, 51% were planned for the Wenatchee River and its tributaries, 31% were released at Chelan Falls, and the remainder were split between the Methow (60,000), and Similkameen Rivers (240,000). There were also roughly 350,000 summer steelhead planned for release into this zone over the past week into the Okanogan (83,000), and Wenatchee Rivers (276,000).

Over the next two weeks approximately 4.48 million spring and summer Chinook are scheduled to be released into this zone. Of these, 22% are planned as a direct release from Chief Joseph Hatchery, 19% are scheduled for release into the Okanogan River, 28% into the Wenatchee River at Leavenworth Hatchery, with the remainder being split between the Entiat

(451,000), Methow (577,000), and the Rocky Reach Pool at Wells Hatchery (290,000). Additionally, there is also nearly 1.9 million coho scheduled for release over the next two weeks. 64% of these are scheduled to be released into the Methow River, and the other 36% are planned for release into the Wenatchee River, all of which should begin on the 15<sup>th</sup> and run through the end of the month. Finally, there are three scheduled releases of summer steelhead scheduled for this zone. Two into the Methow at Winthrop Hatchery (215,000), and Twisp River (29,000), and another at Wells Hatchery (180,000).

### **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). Over the past week there were approximately 1.27 million spring Chinook released into this zone. All of these were released into the Umatilla River at Thornhollow and Imeques acclimation ponds. There was also one coho release into the Klickitat River of nearly 2.5 million fish. Finally, there were 574,000 summer steelhead that were planned for release over the past week into the Touchet (142,000), Deschutes (162,000), Klickitat (90,000), as well as Ringold Springs Hatchery (180,000).

Over the next two weeks, there are 2.9 million spring Chinook planned for release. The majority will come from two releases into the Wind River (1.2 million), and the Little White Salmon (1.04 million), with a smaller release of 75,000 into Hood River. The remainder will be released into the Deschutes River (380,000), and the Umatilla River (226,000). At Spring Creek Hatchery, 7 million fall Chinook are planned for release on April 8<sup>th</sup>.

Approximately 251,000 summer steelhead are scheduled to be released into the middle Columbia zone in the next two weeks. Nearly all of these will be in the Umatilla River (250,000), with a release of 1000 into the Crooked River on April 12<sup>th</sup>. Finally, just over 1 million coho are planned for release into this zone over the next two weeks. Just over half into the Yakima River (533k) with the remainder being released into the Umatilla River (506,000) on April 10<sup>th</sup>

### **Lower Columbia Zone:**

The Lower Columbia Zone is defined as the Columbia River and its tributaries below Bonneville

Dam. Over the past week approximately 470,000 spring Chinook were planned for release into this zone. Of these, only 66,000 were released into the Sandy River, with the rest being released into the Cowlitz River (154,000), and at the Deep River net pens (250,000). There were also approximately 1.48 million summer steelhead released into this zone, with 576,000 into the Willamette and its tributaries, 640,000 into the Cowlitz, and the remainder divided between the Lewis (59,000), Kalama (91,000), Toutle (20,000), Washougal (70,000), and Elochoman Rivers (30,000). Winter steelhead releases totaled 949,000 in the past week. With 100,000 released at the Eagle Creek Hatchery, 105,000 into the Washougal, 40,000 at Klaskanine Hatchery, 60,000 at Big Creek, and another 40,000 at Gnat Creek. The remainder are releases that began on the first of April and are scheduled to run through the end of the month: Salmon Creek (40,000), Beaver Creek (126,000), Grays River (5,000), and the Kalama River (98,000).

Finally, there were also 4.65 million juvenile coho released into the Lower Columbia in the past week. 50% of these are an ongoing release into the Cowlitz River that is scheduled to run through the end of May. Two more volitional releases began on April 1<sup>st</sup> that are scheduled to run through the end of the month in the Lewis (2 million), and Kalama Rivers (306,000).

Over the next two weeks there is one planned release of fall Chinook into the lower Columbia of 1.6 million Tule's at Tanner Creek. Three spring Chinook releases are also planned for Tongue Point on the Columbia (200,000) and Dexter Pond on the Willamette (234,000), and Youngs Bay (300,000). In addition, another 2.7 million coho are also planned for release in this zone over the next two weeks. Approximately 28% of these will be released into Youngs Bay, 28% into the Klaskanine River, 17% at Blind Slough, and the remainder split between the Chinook River (78,000), Eagle Creek (350,000), Elochoman River (108,000), and the Sandy River (20,000). Approximately 150,000 summer steelhead are scheduled to be released into the Lower Columbia zone in the next two weeks, all at Cedar Creek on the Sandy River. Scheduled winter steelhead releases total roughly 395,000 fish in this zone over the next two weeks. Most of these will be released into the Sandy River (320,000), with the remaining 75,000 released into the Clackamas River.

## Adult Passage

Bonneville Dam uses video counts from January 1<sup>st</sup> through March 31<sup>st</sup> and direct counting after this period. Bonneville Dam counts adult salmon and steelhead year round. Lower Granite Dam uses video counts from March 1<sup>st</sup> through March 31<sup>st</sup> and direct counting after this period. Lower Granite Dam counts adult salmon and steelhead through December 30<sup>th</sup> each year. Willamette Falls Dam also uses video counts and reports adult counts year round. Video counts can cause a delay in posting the count data to the web, because the counting staff at the projects have to review the tapes. The FPC collects the adult count data from projects several times a day and updates Adult Dam Count Report linked on our homepage (<http://www.fpc.org/>). During the winter season at Bonneville Dam (from 1/1/2019 through 3/31/2019), 44 adult Chinook and 1,219 adult steelhead were counted. In 2018 for the same time frame, 22 adult Chinook and 1,677 adult steelhead were counted. The 2019 Bonneville Dam winter season count of adult steelhead had 22 more fish than the 2018 count.

The direct counts at Bonneville Dam showed 2 to 28 adult spring Chinook passing over the project this past week, with a cumulative total of 107 for both direct and video counts (through April 5). There were 69 more fish in this year's count when compared to the 2018 count, while this year's count was about 16.7% of the ten-year average. Adult steelhead direct counts at Bonneville Dam ranged from 23 to 46 this week, with a cumulative total of 1,322 for both direct and video counts through April 5th. This is 72.8% of the 2018 count and 51.8% of the ten-year average. Of the steelhead counted in this year, 708 were unclipped steelhead.

The Willamette Falls cumulative steelhead count from January 1<sup>st</sup> through April 3<sup>rd</sup> is 2,633. The 2019 Willamette Falls winter steelhead count has 1,561 more fish than the 2018 count of 1,072 while being about 74% of the 10-year average count of 3,558. This year's Lower Granite steelhead count of 1,991 has 385 fewer fish than the 2018 count of 2,376 and is about 35.4% of the 10-year average count of 5,625.



## Hatchery Releases Last Two Weeks

### Hatchery Release Summary

From: 3/23/2019 to 04/05/19

Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver	Zone
Colville Tribe	Wells Hatchery	ST	SU	2019	83,700	04-01-19	04-01-19	Okanogan River	Okanogan River	UCOL
<b>Colville Tribe Total</b>					<b>83,700</b>					
Idaho Dept. of Fish and Game	Clearwater Hatchery	CH1	SP	2019	691,278	03-18-19	04-03-19	Kooskia Hatchery	Clearwater River M F	SNAK
Idaho Dept. of Fish and Game	Clearwater Hatchery	CH1	SP	2019	702,893	03-27-19	03-28-19	Clearwater River	Clearwater River M F	SNAK
Idaho Dept. of Fish and Game	Clearwater Hatchery	CH1	SP	2019	1,181,465	03-25-19	03-29-19	Red River	S Fk Clearwater River	SNAK
Idaho Dept. of Fish and Game	Clearwater Hatchery	ST	SU	2019	189,915	04-03-19	04-03-19	S Fk Clearwater River	Clearwater River M F	SNAK
Idaho Dept. of Fish and Game	Clearwater Hatchery	ST	SU	2019	473,417	04-03-19	04-09-19	S Fk Clearwater River	Clearwater River M F	SNAK
Idaho Dept. of Fish and Game	Hagerman NFH	ST	SU	2019	1,581,507	04-02-19	04-30-19	Salmon River (ID)	Salmon River (ID)	SNAK
Idaho Dept. of Fish and Game	Magic Valley Hatchery	ST	SU	2019	616,000	04-01-19	04-09-19	Yankee Fk (Salmon R)	Salmon River (ID)	SNAK
Idaho Dept. of Fish and Game	McCall Hatchery	CH1	SU	2019	127,763	03-29-19	04-01-19	Johnson Cr Idaho	South Fork Salmon River	SNAK
Idaho Dept. of Fish and Game	McCall Hatchery	CH1	SU	2019	160,956	04-01-19	04-05-19	S Fk Salmon River	Salmon River (ID)	SNAK
Idaho Dept. of Fish and Game	Niagara Springs	ST	SU	2019	559,600	03-18-19	03-29-19	Hells Canyon Dam	Snake River	SNAK
Idaho Dept. of Fish and Game	Niagara Springs	ST	SU	2019	802,000	04-01-19	04-15-19	Pahsimeroi River	Pahsimeroi River	SNAK
Idaho Dept. of Fish and Game	Sawtooth Hatchery	CH1	SP	2019	86,918	03-26-19	03-27-19	Salmon River (ID)	Salmon River (ID)	SNAK
Idaho Dept. of Fish and Game	Sawtooth Hatchery	CH1	SP	2019	919,502	03-26-19	03-27-19	Salmon River (ID)	Salmon River (ID)	SNAK
<b>Idaho Dept. of Fish and Game Total</b>					<b>8,093,214</b>					
Nez Perce Tribe	Dworshak NFH	CH1	SP	2019	247,263	03-27-19	03-27-19	Kooskia Hatchery	Clearwater River M F	SNAK
Nez Perce Tribe	Lyons Ferry Hatchery	CH1	FA	2019	160,000	04-04-19	04-02-19	Cpt John Acclim Pond	Snake River	SNAK
<b>Nez Perce Tribe Total</b>					<b>407,263</b>					
Oregon Dept. of Fish and Wildlife	Big Creek Hatchery	CM	UN	2019	290,000	03-29-19	03-29-19	Big Creek Hatchery	Big Creek	LCOL
Oregon Dept. of Fish and Wildlife	Big Creek Hatchery	ST	WI	2019	40,000	04-05-19	04-05-19	Gnat Creek	Col R Bel. Bon Dam	LCOL
Oregon Dept. of Fish and Wildlife	Big Creek Hatchery	ST	WI	2019	40,000	04-05-19	04-05-19	Klaskanine Hatchery	Klaskanine River	LCOL
Oregon Dept. of Fish and Wildlife	Big Creek Hatchery	ST	WI	2019	60,000	04-05-19	04-05-19	Big Creek Hatchery	Big Creek	LCOL
Oregon Dept. of Fish and Wildlife	Bonneville Hatchery	ST	SU	2019	150,000	04-05-19	04-05-19	Clackamas River	Clackamas River	LCOL
Oregon Dept. of Fish and Wildlife	Clackamas Hatchery	ST	WI	2019	100,000	03-31-19	03-31-19	Eagle Creek Hatchery	Eagle Creek	LCOL
Oregon Dept. of Fish and Wildlife	Irrigon Hatchery Complex	ST	SU	2019	215,000	04-02-19	04-02-19	Little Sheep Creek	Imnaha River	SNAK
Oregon Dept. of Fish and Wildlife	Irrigon Hatchery Complex	ST	SU	2019	320,000	04-02-19	04-02-19	Wallowa Acclim Pond	Wallowa River	SNAK
Oregon Dept. of Fish and Wildlife	Leaburg Hatchery	ST	SU	2019	108,000	04-05-19	04-05-19	McKenzie River	Willamette River	LCOL
Oregon Dept. of Fish and Wildlife	Lookingglass Hatchery	CH1	SP	2019	250,000	04-02-19	04-02-19	Lookingglass Creek	Grande Ronde River	SNAK
Oregon Dept. of Fish and Wildlife	Lookingglass Hatchery	CH1	SP	2019	280,000	04-02-19	04-02-19	Imnaha Acclim Pond	Imnaha River	SNAK
Oregon Dept. of Fish and Wildlife	Marion Forks Hatchery	CH1	SP	2019	250,000	03-29-19	03-29-19	Tongue Pt	Col R Bel. Bon Dam	LCOL
Oregon Dept. of Fish and Wildlife	Roaring River Hatchery	ST	SU	2019	96,000	04-02-19	04-02-19	Willamette River	Willamette River	LCOL
Oregon Dept. of Fish and Wildlife	Round Butte Hatchery	ST	SU	2019	162,000	04-05-19	04-05-19	Deschutes River	Deschutes River	MCOL
Oregon Dept. of Fish and Wildlife	Sandy Hatchery	CH1	SP	2019	66,000	04-05-19	04-05-19	Bull Run Acclimation	Sandy River	LCOL
Oregon Dept. of Fish and Wildlife	South Santiam Hatchery	ST	SU	2019	90,000	03-29-19	03-29-19	Santiam River & N Fk	Santiam River	LCOL
Oregon Dept. of Fish and Wildlife	South Santiam Hatchery	ST	SU	2019	161,500	04-03-19	04-03-19	Santiam River	Willamette River	LCOL
Oregon Dept. of Fish and Wildlife	Willamette Hatchery	ST	SU	2019	61,000	04-05-19	04-05-19	M Fk Willamette River	Willamette River	LCOL
Oregon Dept. of Fish and Wildlife	Wizard Falls Hatchery	CH1	SP	2019	7,500	03-26-19	03-26-19	Metolius River	Deschutes River	MCOL
Oregon Dept. of Fish and Wildlife	Wizard Falls Hatchery	CH1	SP	2019	7,500	03-26-19	03-26-19	Wychus Creek	Deschutes River	MCOL
Oregon Dept. of Fish and Wildlife	Wizard Falls Hatchery	CH1	SP	2019	10,000	03-26-19	03-26-19	Crooked River (OR)	Deschutes River	MCOL
<b>Oregon Dept. of Fish and Wildlife Total</b>					<b>2,764,500</b>					
U.S. Fish and Wildlife Service	Dworshak NFH	CH1	SP	2019	1,724,382	03-27-19	03-28-19	Dworshak Hatchery	Clearwater River M F	SNAK
U.S. Fish and Wildlife Service	Dworshak NFH	ST	SU	2019	247,263	04-02-19	04-05-19	Lolo Creek	Clearwater River M F	SNAK
U.S. Fish and Wildlife Service	Dworshak NFH	ST	SU	2019	392,045	04-02-19	04-05-19	S Fk Clearwater River	Clearwater River M F	SNAK
U.S. Fish and Wildlife Service	Dworshak NFH	ST	SU	2019	421,976	04-02-19	04-05-19	Clear Creek	Clearwater River M F	SNAK
U.S. Fish and Wildlife Service	Dworshak NFH	ST	SU	2019	1,338,720	04-02-19	04-05-19	Dworshak Hatchery	Clearwater River M F	SNAK
<b>U.S. Fish and Wildlife Service Total</b>					<b>4,124,386</b>					
Umatilla Tribe	Carson NFH	CH1	SP	2019	250,000	03-28-19	03-28-19	Walla Walla River	Walla Walla River	MCOL
Umatilla Tribe	Cascade Hatchery	CO	UN	2019	500,000	03-29-19	03-29-19	Umatilla River	Umatilla River	MCOL
Umatilla Tribe	Lookingglass Hatchery	CH1	SP	2019	150,000	04-02-19	04-02-19	Umatilla River	Umatilla River	MCOL
Umatilla Tribe	Lookingglass Hatchery	CH1	SP	2019	220,000	04-02-19	04-02-19	Thornhollow Acclim Pond	Umatilla River	MCOL
Umatilla Tribe	Lookingglass Hatchery	CH1	SP	2019	440,000	04-02-19	04-02-19	Imeques Acclim Pond	Umatilla River	MCOL
Umatilla Tribe	Umatilla Hatchery	CH1	SP	2019	230,000	04-04-19	04-04-19	Thornhollow Acclim Pond	Umatilla River	MCOL
Umatilla Tribe	Umatilla Hatchery	CH1	SP	2019	231,000	04-05-19	04-05-19	Imeques Acclim Pond	Umatilla River	MCOL
<b>Umatilla Tribe Total</b>					<b>2,021,000</b>					
Washington Dept. of Fish and Wildlife	Beaver Creek Hatchery	ST	SU	2019	30,000	04-01-19	05-01-19	Beaver Creek	Elochoman River	LCOL
Washington Dept. of Fish and Wildlife	Beaver Creek Hatchery	ST	WI	2019	126,000	04-01-19	05-01-19	Beaver Creek	Elochoman River	LCOL
Washington Dept. of Fish and Wildlife	Chelan Hatchery	CH1	SU	2019	530,000	04-01-19	04-01-19	Chelan Falls	Rocky Reach Pool	UCOL
Washington Dept. of Fish and Wildlife	Chewuch Acclim. Pond	CH1	SP	2019	60,000	04-01-19	04-01-19	Chewuch River	Methow River	UCOL
Washington Dept. of Fish and Wildlife	Chiwawa Hatchery	CH1	SP	2019	148,000	04-01-19	04-01-19	Chiwawa River	Wenatchee River	UCOL

Washington Dept. of Fish and Wildlife	Chiwawa Hatchery	CH1	SP	2019	230,000	04-01-19	04-01-19	Nason Creek	Wenatchee River	UCOL
Washington Dept. of Fish and Wildlife	Chiwawa Hatchery	ST	SU	2019	125,000	04-01-19	04-01-19	Chiwawa River	Wenatchee River	UCOL
Washington Dept. of Fish and Wildlife	Chiwawa Hatchery	ST	SU	2019	142,000	04-01-19	04-01-19	Chiwawa River	Wenatchee River	UCOL
Washington Dept. of Fish and Wildlife	COOP	CH1	SP	2019	55,000	03-01-19	04-01-19	Cowlitz River	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	COOP	CO	NO	2019	225	04-01-19	04-01-19	Cowlitz River	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	COOP	ST	WI	2019	5,000	04-01-19	05-01-19	Grays River	Grays River	LCOL
Washington Dept. of Fish and Wildlife	Cowlitz Salmon	CH1	SP	2019	99,000	03-01-19	04-01-19	Cowlitz River	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Cowlitz Salmon	CO	NO	2019	2,348,000	04-01-19	06-01-19	Cowlitz River	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Cowlitz Trout	ST	SU	2019	640,000	04-01-19	05-01-19	Cowlitz River	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Cowlitz Trout	ST	WI	2019	48,000	04-01-19	05-01-19	Cowlitz River	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Cowlitz Trout	ST	WI	2019	113,000	04-01-19	05-01-19	Cowlitz River	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Eastbank Hatchery	CH1	SU	2019	486,000	04-01-19	04-01-19	Wenatchee River	Wenatchee River	UCOL
Washington Dept. of Fish and Wildlife	Fallert Creek Hatchery	ST	SU	2019	91,800	04-01-19	04-01-19	Kalama River	Kalama River	LCOL
Washington Dept. of Fish and Wildlife	Fallert Creek Hatchery	ST	WI	2019	45,900	04-01-19	04-01-19	Kalama River	Kalama River	LCOL
Washington Dept. of Fish and Wildlife	Kalama Falls Hatchery	CO	NO	2019	306,000	04-01-19	05-01-19	Kalama River	Kalama River	LCOL
Washington Dept. of Fish and Wildlife	Kalama Falls Hatchery	ST	WI	2019	40,000	04-01-19	05-01-19	Salmon Creek (WA)	Col R Bel. Bon Dam	LCOL
Washington Dept. of Fish and Wildlife	Kalama Falls Hatchery	ST	WI	2019	52,000	04-01-19	05-01-19	Kalama River	Kalama River	LCOL
Washington Dept. of Fish and Wildlife	Lewis River Hatchery	CO	NO	2019	900,000	04-01-19	05-01-19	Lewis River	Lewis River	LCOL
Washington Dept. of Fish and Wildlife	Lewis River Hatchery	CO	SO	2019	1,100,000	04-01-19	05-01-19	Lewis River	Lewis River	LCOL
Washington Dept. of Fish and Wildlife	Lyons Ferry Hatchery	CH0	FA	2019	449,000	04-01-19	04-01-19	Lyons Ferry Hatchery	Snake River	SNAK
Washington Dept. of Fish and Wildlife	Lyons Ferry Hatchery	ST	SU	2019	39,400	04-01-19	04-01-19	Dayton Acclim Pond	Touchet River	MCOL
Washington Dept. of Fish and Wildlife	Lyons Ferry Hatchery	ST	SU	2019	102,700	04-01-19	04-01-19	Dayton Acclim Pond	Touchet River	MCOL
Washington Dept. of Fish and Wildlife	Lyons Ferry Hatchery	ST	SU	2019	104,400	04-01-19	04-01-19	Tucannon River	Tucannon River	SNAK
Washington Dept. of Fish and Wildlife	Lyons Ferry Hatchery	ST	SU	2019	227,200	04-01-19	04-01-19	Grande Ronde River	Grande Ronde River	SNAK
Washington Dept. of Fish and Wildlife	Merwin Hatchery	ST	SU	2019	59,000	04-01-19	05-01-19	Lewis River	Lewis River	LCOL
Washington Dept. of Fish and Wildlife	Merwin Hatchery	ST	WI	2019	175,000	04-01-19	05-01-19	Lewis River	Lewis River	LCOL
Washington Dept. of Fish and Wildlife	Ringold Springs Hatchery	ST	SU	2019	180,000	04-01-19	05-01-19	Ringold Springs Hatchery	McNary Pool	MCOL
Washington Dept. of Fish and Wildlife	Similkameen Hatchery	CH1	SU	2019	240,000	04-01-19	04-01-19	Similkameen River	Okanogan River	UCOL
Washington Dept. of Fish and Wildlife	Skamania Hatchery	ST	SU	2019	20,000	04-01-19	04-01-19	Toutle River	Toutle River	LCOL
Washington Dept. of Fish and Wildlife	Skamania Hatchery	ST	SU	2019	70,000	04-01-19	05-01-19	Washougal River	Washougal River	LCOL
Washington Dept. of Fish and Wildlife	Skamania Hatchery	ST	SU	2019	90,000	04-01-19	05-01-19	Klickitat River	Klickitat River	MCOL
Washington Dept. of Fish and Wildlife	Skamania Hatchery	ST	WI	2019	105,000	04-01-19	04-01-19	Washougal River	Washougal River	LCOL
Washington Dept. of Fish and Wildlife	Tucannon Hatchery	CH1	SP	2019	150,500	04-01-19	04-01-19	Tucannon River	Tucannon River	SNAK
Washington Dept. of Fish and Wildlife	Washougal Hatchery	CH1	SP	2019	250,000	04-01-19	05-01-19	Deep River Net Pens	Grays River	LCOL
Washington Dept. of Fish and Wildlife	Washougal Hatchery	CO	NO	2019	2,500,000	04-01-19	04-01-19	Klickitat River	Klickitat River	MCOL
<b>Washington Dept. of Fish and Wildlife Total</b>					<b>12,483,125</b>					
Yakama Tribe	Cascade Hatchery	CO	UN	2019	310	03-29-19	03-29-19	Wenatchee River	Wenatchee River	UCOL
Yakama Tribe	Klickitat Hatchery	CH1	SP	2019	634,000	03-26-19	03-26-19	Klickitat Hatchery	Klickitat River	MCOL
<b>Yakama Tribe Total</b>					<b>634,310</b>					
<b>Grand Total</b>					<b>30,611,498</b>					

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

## Hatchery Releases Next Two Weeks

### Hatchery Release Summary

From: **4/6/2019** to **4/19/2019**

Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver	Zone
Colville Tribe	Chief Joseph Hatchery	CH1	SP	2019	202,000	04-15-19	04-22-19		Okanogan River	UCOL
Colville Tribe	Chief Joseph Hatchery	CH1	SP	2019	556,000	04-15-19	04-22-19	Chief Joseph Hatchery	Wells Pool	UCOL
Colville Tribe	Chief Joseph Hatchery	CH1	SU	2019	303,000	04-15-19	04-22-19		Okanogan River	UCOL
Colville Tribe	Chief Joseph Hatchery	CH1	SU	2019	380,000	04-15-19	04-22-19	Similkameen Acclim Pd	Okanogan River	UCOL
Colville Tribe	Chief Joseph Hatchery	CH1	SU	2019	464,000	04-15-19	04-22-19	Chief Joseph Hatchery	Wells Pool	UCOL
<b>Colville Tribe Total</b>					<b>1,905,000</b>					
Douglas County PUD	Methow Hatchery	CH1	SP	2019	29,358	04-15-19	04-15-19	Twisp River	Methow River	UCOL
Douglas County PUD	Methow Hatchery	CH1	SP	2019	124,866	04-15-19	04-15-19	Methow Hatchery	Methow River	UCOL
Douglas County PUD	Wells Hatchery	CH1	SU	2019	290,700	04-15-19	04-19-19	Wells Hatchery	Rocky Reach Pool	UCOL
Douglas County PUD	Wells Hatchery	ST	SU	2019	28,900	04-15-19	04-26-19	Twisp River	Methow River	UCOL
Douglas County PUD	Wells Hatchery	ST	SU	2019	180,000	04-15-19	04-26-19	Wells Hatchery	Rocky Reach Pool	UCOL
<b>Douglas County PUD Total</b>					<b>653,824</b>					
Idaho Dept. of Fish and Game	Clearwater Hatchery	ST	SU	2019	123,956	04-10-19	04-12-19	Newsome Creek	S Fk Clearwater River	SNAK
Idaho Dept. of Fish and Game	Clearwater Hatchery	ST	SU	2019	473,417	04-03-19	04-09-19	S Fk Clearwater River	Clearwater River M F	SNAK
Idaho Dept. of Fish and Game	Magic Valley Hatchery	ST	SU	2019	106,000	04-12-19	04-15-19	Pahsimeroi River	Pahsimeroi River	SNAK
Idaho Dept. of Fish and Game	Magic Valley Hatchery	ST	SU	2019	143,800	04-11-19	04-12-19	Pahsimeroi River	Pahsimeroi River	SNAK
Idaho Dept. of Fish and Game	Magic Valley Hatchery	ST	SU	2019	217,000	04-17-19	04-19-19	Little Salmon River	Salmon River (ID)	SNAK
Idaho Dept. of Fish and Game	Magic Valley Hatchery	ST	SU	2019	282,900	04-09-19	04-22-19	Sawtooth Hatchery	Salmon River (ID)	SNAK
Idaho Dept. of Fish and Game	Magic Valley Hatchery	ST	SU	2019	616,000	04-01-19	04-09-19	Yankee Fk (Salmon R)	Salmon River (ID)	SNAK
Idaho Dept. of Fish and Game	Niagara Springs	ST	SU	2019	177,000	04-16-19	04-22-19	Little Salmon River	Salmon River (ID)	SNAK
Idaho Dept. of Fish and Game	Niagara Springs	ST	SU	2019	802,000	04-01-19	04-15-19	Pahsimeroi River	Pahsimeroi River	SNAK
Idaho Dept. of Fish and Game	Pahsimeroi Hatchery	CH1	SU	2019	60,000	04-15-19	04-24-19	Pahsimeroi River	Pahsimeroi River	SNAK
Idaho Dept. of Fish and Game	Pahsimeroi Hatchery	CH1	SU	2019	780,000	04-15-19	04-24-19	Pahsimeroi River	Pahsimeroi River	SNAK
<b>Idaho Dept. of Fish and Game Total</b>					<b>3,782,073</b>					
Nez Perce Tribe	Lookingglass Hatchery	CH1	SP	2019	250,000	04-19-19	04-19-19	Lostine Accim Pond	Wallowa River	SNAK
<b>Nez Perce Tribe Total</b>					<b>250,000</b>					
Oregon Dept. of Fish and Wildlife	Bonneville Hatchery	CH0	FA	2019	1,600,000	04-18-19	04-18-19	Tanner Creek	Tanner Creek	LCOL
Oregon Dept. of Fish and Wildlife	Bonneville Hatchery	ST	SU	2019	75,000	04-18-19	04-18-19	Cedar Creek (Sandy R)	Sandy River	LCOL
Oregon Dept. of Fish and Wildlife	Bonneville Hatchery	ST	WI	2019	25,000	04-11-19	04-11-19	Clackamas River	Clackamas River	LCOL
Oregon Dept. of Fish and Wildlife	Bonneville Hatchery	ST	WI	2019	50,000	04-11-19	04-11-19	Clackamas Hatchery	Clackamas River	LCOL
Oregon Dept. of Fish and Wildlife	Clatsop County Fisheries	CO	UN	2019	385,000	04-12-19	04-12-19	S Fk Klaskanine River	Klaskanine River	LCOL
Oregon Dept. of Fish and Wildlife	Irrigon Hatchery Complex	ST	SU	2019	320,000	04-16-19	04-16-19	Deer Creek	Wallowa River	SNAK
Oregon Dept. of Fish and Wildlife	Lookingglass Hatchery	ST	SU	2019	50,000	04-19-19	04-19-19	Minthorn Acclimation Pond	Umatilla River	MCOL
Oregon Dept. of Fish and Wildlife	Lookingglass Hatchery	ST	SU	2019	50,000	04-19-19	04-19-19	Pendelton Acclim Pond	Umatilla River	MCOL
Oregon Dept. of Fish and Wildlife	Lookingglass Hatchery	ST	SU	2019	50,000	04-19-19	04-19-19	Umatilla River	Umatilla River	MCOL
Oregon Dept. of Fish and Wildlife	Marion Forks Hatchery	CH1	SP	2019	200,000	04-08-19	04-08-19	Tongue Pt	Col R Bel. Bon Dam	LCOL
Oregon Dept. of Fish and Wildlife	Marion Forks Hatchery	CH1	SP	2019	300,000	04-08-19	04-08-19	Youngs Bay	Youngs River	LCOL
Oregon Dept. of Fish and Wildlife	Oak Springs Hatchery	ST	WI	2019	160,000	04-12-19	04-12-19	Cedar Creek (Sandy R)	Sandy River	LCOL
Oregon Dept. of Fish and Wildlife	Opal Springs Hatchery	ST	SU	2019	1,000	04-12-19	04-12-19	Crooked River (OR)	Deschutes River	MCOL
Oregon Dept. of Fish and Wildlife	Oxbow-Oregon	CO	UN	2019	385,000	04-12-19	04-12-19	S Fk Klaskanine River	Klaskanine River	LCOL
Oregon Dept. of Fish and Wildlife	Oxbow-Oregon	CO	UN	2019	450,000	04-12-19	04-12-19	Blind Slough	Col R Bel. Bon Dam	LCOL
Oregon Dept. of Fish and Wildlife	Oxbow-Oregon	CO	UN	2019	766,193	04-12-19	04-12-19	Youngs Bay	Youngs River	LCOL
Oregon Dept. of Fish and Wildlife	Round Butte Hatchery	CH1	SP	2019	80,000	04-12-19	04-12-19	Deschutes River	Deschutes River	MCOL
Oregon Dept. of Fish and Wildlife	Round Butte Hatchery	CH1	SP	2019	300,000	04-12-19	04-12-19	Deschutes River	Deschutes River	MCOL
Oregon Dept. of Fish and Wildlife	Sandy Hatchery	CO	UN	2019	200,000	04-12-19	04-12-19	Cedar Creek (Sandy R)	Sandy River	LCOL
Oregon Dept. of Fish and Wildlife	Sandy Hatchery	ST	SU	2019	75,000	04-18-19	04-18-19	Cedar Creek (Sandy R)	Sandy River	LCOL
Oregon Dept. of Fish and Wildlife	Sandy Hatchery	ST	WI	2019	160,000	04-12-19	04-12-19	Cedar Creek (Sandy R)	Sandy River	LCOL
Oregon Dept. of Fish and Wildlife	Willamette Hatchery	CH1	SP	2019	234,000	04-12-19	04-12-19	M Fk Willamette River	Willamette River	LCOL
<b>Oregon Dept. of Fish and Wildlife Total</b>					<b>5,916,193</b>					
U.S. Fish and Wildlife Service	Carson NFH	CH1	SP	2019	1,200,000	04-10-19	04-10-19	Wind River	Wind River	MCOL
U.S. Fish and Wildlife Service	Eagle Creek NFH	CO	UN	2019	350,000	04-10-19	04-10-19	Eagle Creek Hatchery	Eagle Creek	LCOL
U.S. Fish and Wildlife Service	Entiat Hatchery	CH1	SU	2019	451,000	04-16-19	04-16-19	Entiat Hatchery	Entiat River	UCOL
U.S. Fish and Wildlife Service	Leavenworth NFH	CH1	SP	2019	1,257,831	04-17-19	04-19-19	Leavenworth Hatchery	Wenatchee River	UCOL
U.S. Fish and Wildlife Service	Little White Salmon NFH	CH1	SP	2019	1,040,000	04-11-19	04-11-19	Little White Salmon Hatchery	Little White Salmon River	MCOL
U.S. Fish and Wildlife Service	Spring Creek NFH	CH0	FA	2019	7,000,000	04-08-19	04-08-19	Spring Creek Hatchery	Bonneville Pool	MCOL
U.S. Fish and Wildlife Service	Winthrop NFH	CH1	SP	2019	423,000	04-15-19	04-15-19	Methow River	Methow River	UCOL
U.S. Fish and Wildlife Service	Winthrop NFH	ST	SU	2019	215,000	04-15-19	05-03-19	Winthrop Hatchery	Methow River	UCOL
<b>U.S. Fish and Wildlife Service Total</b>					<b>11,936,831</b>					

Umatilla Tribe	Leaburg Hatchery	CO	UN	2019	506,000	04-10-19	04-10-19	Pendelton Acclim Pond	Umatilla River	MCOL
Umatilla Tribe	Lookingglass Hatchery	CH1	SP	2019	150,000	04-19-19	04-19-19	Catherine Cr Acclim Pond	Grande Ronde River	SNAK
Umatilla Tribe	Lookingglass Hatchery	CH1	SP	2019	250,000	04-16-19	04-16-19	Grande Ronde Acclim Pond	Grande Ronde River	SNAK
Umatilla Tribe	Umatilla Hatchery	CH1	SP	2019	226,000	04-15-19	04-15-19	Imeques Acclim Pond	Umatilla River	MCOL
Umatilla Tribe	Umatilla Hatchery	ST	SU	2019	100,000	04-19-19	04-19-19	Pendelton Acclim Pond	Umatilla River	MCOL
<b>Umatilla Tribe Total</b>					<b>1,232,000</b>					
Warm Springs Tribe	Round Butte Hatchery	CH1	SP	2019	75,000	04-12-19	04-12-19	W Fk Hood River	Hood River	MCOL
<b>Warm Springs Tribe Total</b>					<b>75,000</b>					
Yakama Tribe	Cascade Hatchery	CO	UN	2019	42,475	04-15-19	05-03-19	Mid-Valley Pond	Methow River	UCOL
Yakama Tribe	Cascade Hatchery	CO	UN	2019	65,175	04-15-19	05-03-19	Wenatchee River	Wenatchee River	UCOL
Yakama Tribe	Cascade Hatchery	CO	UN	2019	70,074	04-15-19	05-03-19	Coulter Creek	Wenatchee River	UCOL
Yakama Tribe	Cascade Hatchery	CO	UN	2019	73,997	04-15-19	05-03-19	Beaver Creek	Elochoman River	LCOL
Yakama Tribe	Eagle Creek NFH	CO	UN	2019	69,553	04-15-19	05-03-19	Wenatchee River	Wenatchee River	UCOL
Yakama Tribe	Eagle Creek NFH	CO	UN	2019	108,130	04-15-19	05-03-19	Rolfings Acclim Pond	Wenatchee River	UCOL
Yakama Tribe	Eagle Creek NFH	CO	UN	2019	159,869	04-15-19	04-15-19	Holmes Pond	Yakima River	MCOL
Yakama Tribe	Eagle Creek NFH	CO	UN	2019	160,403	04-15-19	04-15-19	Stiles Pond	Yakima River	MCOL
Yakama Tribe	Eagle Creek NFH	CO	UN	2019	213,681	04-15-19	04-15-19	Easton Pond	Yakima River	MCOL
Yakama Tribe	Willard Hatchery	CO	UN	2019	34,458	04-15-19	05-03-19	Beaver Creek	Elochoman River	LCOL
Yakama Tribe	Willard Hatchery	CO	UN	2019	44,988	04-15-19	05-03-19	Wenatchee River	Wenatchee River	UCOL
Yakama Tribe	Willard Hatchery	CO	UN	2019	78,671	04-15-19	05-03-19	Chinook River	Chinook River	LCOL
Yakama Tribe	Willard Hatchery	CO	UN	2019	98,713	04-15-19	05-03-19	Twisp Acclim Pond	Methow River	UCOL
Yakama Tribe	Willard Hatchery	CO	UN	2019	104,329	04-15-19	05-03-19	Butcher Creek Acclim. Pond	Wenatchee River	UCOL
Yakama Tribe	Willard Hatchery	CO	UN	2019	105,427	04-15-19	05-03-19	Twisp River	Methow River	UCOL
Yakama Tribe	Willard Hatchery	CO	UN	2019	110,952	04-15-19	05-03-19		Methow River	UCOL
Yakama Tribe	Willard Hatchery	CO	UN	2019	182,926	04-15-19	05-03-19	Methow River	Methow River	UCOL
Yakama Tribe	Willard Hatchery	CO	UN	2019	191,563	04-15-19	05-03-19	Mid-Valley Pond	Methow River	UCOL
Yakama Tribe	Willard Hatchery	CO	UN	2019	221,621	04-15-19	05-03-19	Wenatchee River	Wenatchee River	UCOL
Yakama Tribe	Winthrop NFH	CO	UN	2019	246,000	04-15-19	05-03-19	Winthrop Hatchery	Methow River	UCOL
Yakama Tribe	Winthrop NFH	CO	UN	2019	247,223	04-15-19	05-03-19	Winthrop Hatchery	Methow River	UCOL
<b>Yakama Tribe Total</b>					<b>2,630,228</b>					
<b>Grand Total</b>					<b>28,381,149</b>					

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

FISH PASSAGE CENTER

## Daily Average Flow and Spill (in Kcfs)

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### Upper 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
03/22/2019	62.6	0.0	59.0	0.0	70.6	7.0	66.5	3.7	71.2	0.0	75.6	4.2	69.8	0.0
03/23/2019	45.7	0.0	48.2	0.0	49.1	0.0	48.2	0.0	50.1	0.0	63.2	0.0	69.7	0.0
03/24/2019	42.0	0.0	40.8	0.0	48.1	0.0	49.1	0.3	52.2	0.0	74.5	18.8	69.9	0.0
03/25/2019	68.2	0.0	72.3	0.0	62.4	0.0	58.0	0.0	61.1	0.0	69.1	5.5	71.7	0.0
03/26/2019	58.5	0.0	61.1	0.0	68.5	0.0	69.6	3.2	75.0	0.0	68.3	3.9	70.1	0.0
03/27/2019	62.4	0.0	58.1	0.0	63.5	0.0	62.4	0.0	66.2	0.0	71.5	5.2	69.9	0.0
03/28/2019	58.4	0.0	60.1	0.0	58.4	0.0	55.6	4.1	57.8	0.0	67.0	1.0	69.8	0.0
03/29/2019	60.1	0.0	58.8	0.0	60.0	0.0	59.1	3.4	62.8	0.0	68.2	11.7	69.7	0.0
03/30/2019	56.3	0.0	57.1	0.0	62.4	0.0	64.6	0.5	69.2	0.0	82.5	11.5	69.8	0.0
03/31/2019	52.3	0.0	54.9	0.0	56.0	0.0	54.3	0.0	57.5	0.0	62.6	4.2	69.7	0.0
04/01/2019	64.0	0.0	59.1	0.0	65.1	0.4	61.8	0.0	64.9	0.0	74.3	1.0	69.7	0.0
04/02/2019	59.4	0.0	58.4	0.0	62.0	0.0	60.4	0.1	65.6	0.0	67.1	0.0	69.8	0.0
04/03/2019	52.4	0.0	56.1	0.0	51.5	0.0	52.9	0.0	55.9	0.0	65.0	9.7	69.9	0.0

04/04/2019

- Data not available or incorrect

These data were obtained from the Corps of Engineers...

FISH PASSAGE CENTER

### Daily Average Flow and Spill (in Kcfs)

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#### Snake Basin Projects

Date	Dworshak		Brownlee		Hells Canyon		Lower Granite		Little Goose		Lower Monumental		Ice Harbor	
	Flow	Spill	Inflow	Inflow	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
03/22/2019	1.7	0.0			61.8	0.0	61.8	0.0	66.2	0.0	61.0	8.6		
03/23/2019	1.7	0.0			61.7	0.0	62.5	0.0	67.7	0.0	71.2	18.8		
03/24/2019	1.7	0.0			64.8	0.0	59.0	0.0	65.0	0.0	66.1	12.8		
03/25/2019	1.7	0.0			74.3	0.1	73.9	0.0	78.0	0.0	80.1	29.9		
03/26/2019	1.7	0.0			67.4	0.0	63.1	0.0	68.2	0.0	72.7	24.3		
03/27/2019	3.7	0.0			82.3	0.0	80.4	0.0	83.8	0.0	86.0	34.7		
03/28/2019	5.5	0.0			76.9	0.0	79.2	0.0	84.5	0.0	85.6	30.7		
03/29/2019	5.5	0.0			76.4	0.0	76.9	0.0	82.4	0.0	83.3	28.3		
03/30/2019	5.5	0.0			78.3	0.0	76.9	0.0	78.1	0.0	79.4	24.9		
03/31/2019	5.5	0.0			76.6	0.0	79.6	0.0	82.0	0.0	79.7	25.2		
04/01/2019	5.5	0.0			68.9	0.0	64.3	0.0	71.8	0.0	75.9	22.3		
04/02/2019	5.0	0.0			60.2	0.0	62.4	0.0	65.1	0.0	68.8	16.2		
04/03/2019	5.1	0.0			62.6	39.2	59.3	33.7	59.9	41.8	61.9	40.3		
04/04/2019														

- Data not available or incorrect

These data were obtained from the Corps of Engineers...

FISH PASSAGE CENTER

### Daily Average Flow and Spill (in Kcfs)

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#### Mid - Columbia Projects

Date	McNary		John Day		The Dalles		Bonneville		PH1	PH2
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill		
03/22/2019	137.6	0.0	149.1	0.0	148.7	0.0	155.2	1.3	49.5	94.5
03/23/2019	136.7	0.0	157.3	0.0	159.6	0.0	189.6	1.2	83.4	95.1
03/24/2019	143.3	0.0	166.5	0.0	171.9	0.0	177.7	1.3	72.5	94.0
03/25/2019	159.1	0.0	170.1	0.0	165.7	6.0	190.5	1.2	85.6	93.8
03/26/2019	154.5	0.0	179.2	0.0	180.2	13.6	197.6	1.2	91.7	94.7
03/27/2019	156.2	0.0	174.5	0.0	177.7	0.0	201.8	1.3	93.5	97.1
03/28/2019	162.3	0.0	184.4	0.0	181.3	0.0	187.3	1.2	82.8	93.3
03/29/2019	164.1	0.0	179.8	0.0	178.0	0.0	195.8	1.2	91.0	93.6
03/30/2019	162.5	0.0	175.0	0.0	175.6	0.0	196.9	1.2	91.5	94.3
03/31/2019	168.6	0.0	187.2	0.0	185.1	6.4	188.4	1.2	78.0	99.2
04/01/2019	141.1	0.0	168.7	0.0	167.1	7.5	188.9	1.2	79.1	98.7
04/02/2019	136.3	0.0	147.3	0.0	147.7	7.4	165.0	1.2	57.5	96.3
04/03/2019	128.2	0.0	129.4	0.0	126.1	0.0	148.8	1.4	41.0	96.5
04/04/2019									51.6	97.2

- Data not available or incorrect

These data were obtained from the Corps of Engineers...

FISH PASSAGE CENTER

## Gas Bubble Monitoring Program Two Week GBT Monitoring Report

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### LOWER GRANITE DAM

Date	Species Examined	Total Fish Examined	Total Fish w/ GBT	Total Fish w/ Fin GBT	Percent Fish w/ Fin GBT	Percent Fish w/ Severe Fin GBT	Number of Fish with Fin GBT - By Rank			
							Rank 1	Rank 2	Rank 3	Rank 4
04/05/2019	CH1+ST	100	0	0	0.00 %	0.00 %	0	0	0	0

### LITTLE GOOSE DAM

Date	Species Examined	Total Fish Examined	Total Fish w/ GBT	Total Fish w/ Fin GBT	Percent Fish w/ Fin GBT	Percent Fish w/ Severe Fin GBT	Number of Fish with Fin GBT - By Rank			
							Rank 1	Rank 2	Rank 3	Rank 4



Samples highlighted in yellow indicate that the sample size criteria of 100 fish was not met. The inability to collect an adequate sample precludes the accurate estimation of the percentage of fish with GBT and, therefore, no estimate is provided.

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



FISH PASSAGE CENTER

## Gas Bubble Monitoring Program Two Week GBT Monitoring Report

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### LOWER MONUMENTAL DAM

Date	Species Examined	Total Fish Examined	Total Fish w/ GBT	Total Fish w/ Fin GBT	Percent Fish w/ Fin GBT	Percent Fish w/ Severe Fin GBT	Number of Fish with Fin GBT - By Rank			
							Rank 1	Rank 2	Rank 3	Rank 4

### McNARY DAM

Date	Species Examined	Total Fish Examined	Total Fish w/ GBT	Total Fish w/ Fin GBT	Percent Fish w/ Fin GBT	Percent Fish w/ Severe Fin GBT	Number of Fish with Fin GBT - By Rank			
							Rank 1	Rank 2	Rank 3	Rank 4



Samples highlighted in yellow indicate that the sample size criteria of 100 fish was not met. The inability to collect an adequate sample precludes the accurate estimation of the percentage of fish with GBT and, therefore, no estimate is provided.

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

FISH PASSAGE CENTER

## Gas Bubble Monitoring Program Two Week GBT Monitoring Report

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### BONNEVILLE DAM

Date	Species Examined	Total Fish Examined	Total Fish w/ GBT	Total Fish w/ Fin GBT	Percent Fish w/ Fin GBT	Percent Fish w/ Severe Fin GBT	Number of Fish with Fin GBT - By Rank			
							Rank 1	Rank 2	Rank 3	Rank 4

### ROCK ISLAND DAM (ALL FISH)

Date	Species Examined	Total Fish Examined	Total Fish w/ GBT	Total Fish w/ Fin GBT	Percent Fish w/ Fin GBT	Percent Fish w/ Severe Fin GBT	Number of Fish with Fin GBT - By Rank			
							Rank 1	Rank 2	Rank 3	Rank 4



Samples highlighted in yellow indicate that the sample size criteria of 100 fish was not met. The inability to collect an adequate sample precludes the accurate estimation of the percentage of fish with GBT and, therefore, no estimate is provided.

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

FISH PASSAGE CENTER

## Gas Bubble Monitoring Program Two Week GBT Monitoring Report

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### ROCK ISLAND DAM ("TRADITIONAL" EXAMS ONLY)

Date	Species Examined	Total Fish Examined	Total Fish w/ GBT	Total Fish w/ Fin GBT	Percent Fish w/ Fin GBT	Percent Fish w/ Severe Fin GBT	Number of Fish with Fin GBT - By Rank			
							Rank 1	Rank 2	Rank 3	Rank 4

### ROCK ISLAND DAM ("FRESH" EXAMS ONLY)

Date	Species Examined	Total Fish Examined	Total Fish w/ GBT	Total Fish w/ Fin GBT	Percent Fish w/ Fin GBT	Percent Fish w/ Severe Fin GBT	Number of Fish with Fin GBT - By Rank			
							Rank 1	Rank 2	Rank 3	Rank 4



Samples highlighted in yellow indicate that the sample size criteria of 100 fish was not met. The inability to collect an adequate sample precludes the accurate estimation of the percentage of fish with GBT and, therefore, no estimate is provided.

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

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

Date 4/5/2019 7:15:11 AM

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**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	
03/22									101.4	102.0	103.7	24	101.3	101.9	102.3	24	102.7	102.7	102.9	8	102.3	102.6	103.3	24	03/22
03/23									101.0	101.1	101.2	24	102.0	102.6	103.1	24	102.7	102.7	103.9	9	102.2	102.6	103.2	24	03/23
03/24									100.9	101.0	101.0	24	102.2	103.0	103.3	24				0	101.7	102.1	102.4	24	03/24
03/25									101.3	101.8	101.9	24	101.4	101.8	102.3	24	102.6	102.6	102.7	7	101.8	102.4	102.6	22	03/25
03/26									101.7	101.8	101.9	24	101.9	102.4	103.3	24	102.6	102.8	103.0	24	102.8	103.1	103.6	24	03/26
03/27									101.9	102.3	102.6	24	102.2	102.7	103.3	24	102.8	103.4	103.7	24	103.0	103.4	103.9	24	03/27
03/28									101.5	101.6	101.8	24	101.8	102.3	103.1	24	102.8	103.1	103.3	24	103.1	103.3	103.6	24	03/28
03/29									101.0	101.2	101.4	24	101.2	101.7	102.3	24	102.7	102.8	103.2	21	102.6	103.0	103.2	24	03/29
03/30									100.9	101.3	101.4	24	101.6	102.5	103.6	24	102.9	103.3	105.2	15	101.9	102.5	103.5	24	03/30
03/31									101.6	102.0	102.2	24	102.3	103.2	103.7	24	103.4	104.0	105.0	19	102.6	103.3	103.9	24	03/31
04/01									102.4	102.7	102.9	24	102.7	103.4	104.5	24	103.7	103.9	104.1	16	103.1	103.6	103.8	24	04/01
04/02									103.2	103.7	104.0	24	103.7	104.6	105.8	24	104.6	105.3	106.1	24	104.2	104.7	105.1	24	04/02
04/03									103.6	103.8	103.9	24	104.6	105.2	106.0	24	105.0	105.3	105.7	19	104.6	105.0	105.5	24	04/03
04/04									103.3	103.6	103.9	22	104.1	104.7	105.3	22	104.9	105.2	105.6	18	104.8	105.3	105.9	23	04/04

**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	
03/22	102.8	103.2	103.4	24	105.0	107.5	116.1	24	104.0	104.2	104.3	24	105.5	106.6	114.9	22	103.4	103.7	103.9	23	103.4	103.6	103.9	20	03/22
03/23	102.8	103.1	103.5	24	103.1	103.5	104.2	24	103.8	104.0	104.2	24	103.4	103.6	104.0	21	104.8	105.5	106.5	22	104.7	105.5	106.6	20	03/23
03/24	102.7	102.7	102.8	24	102.8	102.9	103.1	24	103.7	103.8	103.9	21	103.7	103.8	104.4	18	103.3	103.5	103.6	23	103.4	103.6	103.7	21	03/24
03/25	103.0	103.5	103.6	24	103.4	104.0	104.5	24	104.8	105.8	107.2	23	104.5	105.5	106.9	22	103.4	103.9	104.2	23	103.1	103.9	104.2	22	03/25
03/26	102.8	103.1	103.1	24	103.2	103.5	103.9	24	106.0	106.5	107.2	24	107.3	109.1	114.7	24	105.2	106.6	108.2	24	105.0	106.0	108.0	21	03/26
03/27	102.8	103.2	103.5	24	103.0	103.5	104.1	24	104.8	105.0	105.3	22	105.6	105.8	106.4	18	105.0	105.4	106.3	22	105.5	106.0	107.0	19	03/27
03/28	102.7	102.9	103.2	24	102.9	103.2	103.5	24	104.1	104.3	104.5	23	105.7	106.3	115.5	16	103.5	103.8	104.1	19	103.6	103.9	104.1	16	03/28
03/29	102.4	102.8	103.4	24	102.6	103.1	103.8	24	103.5	103.7	103.9	23	104.7	106.0	112.3	22	104.4	105.0	106.9	22	104.5	105.1	106.1	22	03/29
03/30	102.9	103.5	103.7	24	103.2	104.1	104.8	24	103.2	103.5	103.7	21	103.9	104.4	107.2	20	103.5	103.8	104.9	23	103.8	104.1	105.0	21	03/30
03/31	104.2	104.9	105.3	24	104.4	105.4	105.8	24	103.9	104.3	104.6	23	104.4	104.9	105.5	22	104.2	104.7	105.2	23	104.2	104.7	105.1	22	03/31
04/01	105.0	105.4	105.5	24	105.5	105.9	106.1	24	104.7	105.1	105.4	23	105.6	105.8	106.3	18	104.4	104.8	105.4	22	104.5	104.7	105.1	17	04/01
04/02	105.7	106.2	106.3	24	106.3	106.7	106.8	24	105.8	106.3	106.7	23	106.5	106.8	107.8	21	105.0	105.8	106.1	23	105.4	105.7	105.9	18	04/02
04/03	105.8	106.0	106.1	24	106.3	106.6	106.8	24	106.8	106.9	107.1	24	107.4	107.9	108.6	22	105.6	106.0	106.3	20	105.8	106.0	106.2	19	04/03
04/04	105.3	105.7	106.0	23	105.4	105.9	106.4	23	106.9	107.1	107.3	22	107.4	107.8	108.1	21	106.0	106.5	106.7	22	106.0	106.3	106.5	19	04/04

FISH PASSAGE CENTER

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

Date 4/5/2019 7:15:11 AM

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**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
03/22	104.0	104.4	105.0	24	105.4	106.8	114.8	24	103.8	103.9	104.2	24	104.2	104.5	105.2	24					03/22
03/23	104.0	104.3	104.5	24	104.2	104.5	104.8	24	103.2	103.4	103.9	24	104.0	104.7	105.9	24					03/23
03/24	103.7	104.0	104.3	24	108.7	113.6	123.1	24	103.6	103.8	104.1	24	104.0	104.4	105.5	24					03/24
03/25	104.1	104.7	104.9	24	106.1	108.2	120.2	24	106.4	109.5	114.6	24	106.0	108.5	113.3	24					03/25
03/26	104.5	105.2	105.5	24	106.0	107.0	110.7	24	107.5	107.9	109.0	24	106.9	108.2	112.2	24					03/26
03/27	104.8	105.2	105.4	24	106.9	108.6	117.7	24	105.9	106.3	107.2	24	106.5	106.8	107.2	24					03/27
03/28	104.7	105.0	105.3	24	105.2	105.7	109.5	24	105.0	105.6	106.1	24	105.2	105.8	107.9	24					03/28
03/29	103.8	104.1	104.4	24	107.2	110.3	123.0	24	104.7	105.0	105.6	24	105.4	105.9	107.6	24					03/29
03/30	105.1	106.2	107.1	24	107.7	110.9	117.3	24	105.2	106.1	106.4	24	106.3	107.8	110.1	24					03/30
03/31	106.9	107.2	107.5	24	107.0	108.5	117.8	24	106.8	107.7	108.9	24	107.9	109.0	111.0	24					03/31
04/01	107.8	108.6	110.0	24	106.9	107.6	108.0	24	107.2	107.7	108.6	24	107.9	108.4	110.1	24					04/01
04/02	109.4	109.6	110.0	24	108.0	108.5	108.8	24	107.7	107.9	108.1	24	108.5	109.0	110.0	24					04/02
04/03	108.5	109.0	109.8	24	109.5	111.2	116.0	24	106.5	106.9	107.5	24	107.6	107.9	108.0	24					04/03
04/04	107.2	107.5	108.3	24	110.6	114.0	117.2	24	106.1	106.8	107.5	24	107.6	108.6	108.9	24					04/04

**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
03/22	103.0	104.3	105.9	24	98.8	99.5	100.2	24	102.4	103.0	103.9	24					105.4	105.6	106.0	24	104.9	105.1	105.2	24	03/22
03/23	102.9	104.1	105.7	24	99.6	100.5	101.2	24	101.7	102.0	102.5	24					104.4	104.7	105.0	24	103.9	104.1	104.5	24	03/23
03/24	102.4	103.2	104.4	24	98.9	99.6	100.3	24	101.4	101.6	101.8	24					103.2	103.6	104.1	24	102.7	103.2	103.6	24	03/24
03/25	102.7	103.9	105.2	24	99.0	99.4	99.9	24	101.9	102.6	103.3	24					102.8	103.2	103.4	24	102.2	102.5	102.8	24	03/25
03/26	102.4	103.4	105.0	24	98.1	98.6	99.1	24	101.9	102.3	102.9	24					102.4	102.5	102.8	24	101.7	101.9	102.2	24	03/26
03/27	98.8	100.3	102.0	24	93.8	95.2	97.2	24	101.4	101.7	102.0	24					102.4	102.6	102.7	24	101.7	101.9	101.9	24	03/27
03/28	96.4	96.5	96.6	24	96.8	99.2	99.4	20	101.3	101.6	101.9	24					102.0	102.3	102.5	24	101.3	101.4	101.6	24	03/28
03/29	95.7	96.0	96.3	24	99.3	99.6	100.0	24	101.3	101.6	102.0	24					101.0	101.4	101.8	24	100.4	100.8	101.0	24	03/29
03/30	95.5	95.9	96.4	24	99.6	100.3	100.8	24	101.8	102.6	103.2	24					100.2	100.5	101.1	24	99.8	100.1	100.3	24	03/30
03/31	96.0	96.6	97.2	24	99.9	100.6	101.2	24	101.9	102.6	103.2	24					101.3	101.7	102.3	24	100.7	101.2	101.5	24	03/31
04/01	96.5	97.1	97.7	24	99.9	100.7	101.4	24	102.1	102.8	103.5	24					102.6	103.0	103.6	24	102.0	102.5	103.0	24	04/01
04/02	97.3	97.9	98.6	24	100.4	101.2	101.7	24	101.9	102.5	103.2	24					104.1	104.3	104.6	24	103.5	104.0	104.5	24	04/02
04/03	96.8	97.0	97.4	24	99.6	99.9	100.4	24	101.3	101.6	102.1	24					103.6	103.9	104.3	24	115.3	117.6	118.8	24	04/03
04/04	96.6	96.8	97.2	23	99.7	100.1	100.3	23	101.4	101.9	102.3	23					102.9	103.0	103.1	23	115.8	118.1	119.0	23	04/04

FISH PASSAGE CENTER

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

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**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
03/22	104.6	105.1	105.9	24	104.7	105.1	105.5	24	104.8	105.1	105.5	24	104.8	105.0	105.7	24				0	106.4	107.0	107.3	24	03/22
03/23	104.7	104.9	105.1	24	104.5	105.0	105.0	24	104.4	104.6	104.8	24	104.3	104.5	104.8	24				0	108.5	110.1	110.4	24	03/23
03/24	105.6	105.9	105.9	24	105.1	105.2	105.5	24	104.2	104.4	104.7	24	104.3	104.5	104.8	24				0	106.6	106.8	107.1	24	03/24
03/25	105.6	106.0	106.2	24	105.5	105.9	106.2	24	104.6	105.1	105.4	24	104.8	105.2	105.5	24				0	112.8	117.2	117.4	24	03/25
03/26	105.1	105.3	105.5	24	104.8	105.0	105.4	24	105.0	105.3	105.8	24	105.2	105.4	105.6	24	104.8	104.8	105.5	15	112.3	114.2	117.2	24	03/26
03/27	104.5	104.9	105.2	24	103.8	104.1	104.4	24	105.7	105.9	106.0	24	105.7	106.0	106.3	24	105.1	105.2	105.3	24	115.4	115.7	115.8	24	03/27
03/28	102.4	102.6	103.1	24	102.1	102.3	102.7	24	104.3	104.6	105.0	24	104.3	104.7	105.2	24	104.5	104.6	104.9	24	113.9	114.3	115.6	24	03/28
03/29	101.2	101.5	102.0	24	100.9	101.3	101.6	24	102.6	103.1	103.6	24	102.6	103.0	103.2	24	104.0	104.1	104.4	24	113.3	113.7	113.9	24	03/29
03/30	100.3	100.4	100.5	24	100.3	100.7	101.0	24	101.5	101.6	101.8	24	101.6	101.8	102.1	24	103.5	103.6	103.9	24	112.4	113.3	113.9	24	03/30
03/31	100.9	101.2	101.4	24	101.1	101.5	101.7	24	101.5	101.6	101.9	24	101.8	102.0	102.2	24	103.4	103.6	103.7	24	113.0	113.2	113.4	24	03/31
04/01	101.5	101.8	101.9	24	101.8	102.3	102.9	24	101.9	102.1	102.2	24	102.3	102.7	103.1	24	103.4	103.5	103.7	24	112.2	113.2	113.4	24	04/01
04/02	102.1	102.3	102.4	24	102.7	103.1	103.6	23	102.7	103.1	103.3	24	103.4	103.9	104.4	24	103.7	103.9	104.1	24	108.9	110.3	113.3	24	04/02
04/03	102.8	102.9	103.0	24	114.5	117.8	118.6	24	103.2	103.4	103.6	23	118.1	119.3	120.3	24	103.3	103.5	103.6	24	113.0	115.4	115.7	24	04/03
04/04	102.5	102.7	103.0	23	116.2	119.1	119.8	23	102.8	103.0	103.2	23	119.2	120.0	121.1	23	102.9	103.2	104.0	23	114.0	115.9	116.3	23	04/04

**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
03/22				0	105.9	106.2	106.7	24	106.6	106.8	107.0	24	107.1	107.6	108.1	24	106.1	106.4	106.8	24	105.6	105.9	106.1	24	03/22
03/23				0	106.4	107.0	107.3	24	106.4	106.5	106.7	24	106.3	106.5	107.0	24	106.0	106.1	106.3	24	105.5	105.9	106.2	24	03/23
03/24				0	106.2	106.4	106.5	24	106.7	106.8	107.1	24	106.7	107.0	107.5	24	106.0	106.2	106.3	24	105.3	105.5	105.6	24	03/24
03/25				0	105.7	106.0	106.3	24	107.5	107.9	108.3	24	107.0	107.4	107.5	24	106.8	107.1	107.3	24	106.3	107.1	108.1	24	03/25
03/26	106.7	106.7	107.4	11	105.3	106.0	106.3	24	107.8	108.2	108.6	23	107.2	107.6	107.9	24	106.6	107.0	107.3	24	107.1	107.4	107.9	24	03/26
03/27	106.6	107.3	108.1	24	106.0	106.2	106.3	24	108.7	108.8	109.1	24	108.1	108.3	108.7	24	107.1	107.4	107.6	24	106.2	106.5	106.6	24	03/27
03/28	106.9	107.8	109.1	24	106.3	107.2	107.4	24	107.9	108.1	108.2	24	107.2	107.4	107.5	24	106.4	106.6	106.9	24	105.6	105.8	106.0	24	03/28
03/29	106.5	107.1	107.7	24	106.1	106.4	106.9	24	107.2	107.5	107.9	24	106.1	106.3	106.6	24	106.0	106.2	106.4	24	105.3	105.4	105.6	24	03/29
03/30	107.6	107.8	108.4	24	107.1	107.4	107.6	24	106.8	107.0	107.2	24	106.0	106.4	106.7	24	105.8	106.1	106.3	24	105.0	105.4	105.6	24	03/30
03/31	108.6	109.0	110.0	24	107.9	108.3	108.5	24	107.4	107.8	108.6	24	106.4	106.8	107.0	24	106.7	107.0	107.2	24	106.1	106.9	107.3	24	03/31
04/01	109.7	110.0	110.3	24	108.9	109.1	109.2	24	108.1	108.4	108.7	24	107.0	107.2	107.3	24	106.9	107.1	107.3	24	106.5	107.1	107.4	24	04/01
04/02	110.3	110.4	110.6	24	109.5	109.8	110.2	24	108.6	108.8	109.8	24	107.1	107.2	107.3	24	107.3	107.5	107.7	24	106.9	107.6	107.8	24	04/02
04/03	109.5	109.8	110.2	24	108.8	109.1	109.2	24	107.8	108.1	108.3	24	107.2	107.4	107.8	24	106.7	106.9	107.0	24	106.0	106.2	106.3	24	04/03
04/04	109.0	109.3	109.6	22	108.5	108.8	109.2	22	107.6	108.0	108.3	22	107.2	107.4	107.7	22	106.1	106.5	106.9	22	105.4	105.6	105.8	22	04/04

FISH PASSAGE CENTER

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

Date 4/5/2019 7:15:11 AM

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**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	
03/22	107.4	107.5	107.8	24	108.4	109.2	109.9	24	107.9	108.4	108.8	24	109.8	110.4	110.8	24	03/22
03/23	107.1	107.4	107.7	24	107.4	107.9	108.4	24	108.0	108.5	109.1	24	109.9	110.2	110.5	24	03/23
03/24	106.5	106.8	107.2	24	107.1	107.5	108.0	24	108.3	109.1	110.1	24	109.0	109.2	109.4	24	03/24
03/25	106.4	106.7	106.9	24	106.6	107.0	107.5	24	106.0	106.6	108.0	24	109.1	109.4	109.6	24	03/25
03/26	106.6	107.2	107.5	24	106.6	107.4	107.8	24	106.9	108.1	108.9	24	109.0	109.7	110.0	24	03/26
03/27	107.5	107.6	107.8	24	107.2	107.4	107.7	24	106.1	106.7	107.8	24	109.6	109.9	110.2	24	03/27
03/28	107.0	107.2	107.4	24	107.1	107.6	108.1	24	106.1	107.5	108.4	24	109.9	110.3	110.5	24	03/28
03/29	106.0	106.2	106.4	24	106.4	106.8	107.3	24	106.9	107.6	108.6	24	109.3	109.6	110.1	24	03/29
03/30	106.3	106.8	107.2	24	106.5	107.2	107.8	24	106.9	108.0	109.1	24	109.4	110.0	110.7	24	03/30
03/31	107.1	107.6	107.9	24	107.5	108.4	109.3	24	107.2	108.6	109.6	24	109.8	110.1	110.4	24	03/31
04/01	107.7	107.9	108.2	24	108.1	108.6	109.0	24	108.0	108.6	109.4	24	110.1	110.3	110.3	24	04/01
04/02	108.5	108.7	108.8	24	109.0	109.9	110.3	24	108.5	108.9	109.1	24	110.8	111.3	111.5	24	04/02
04/03	107.9	108.0	108.1	24	108.7	109.6	110.1	24	108.4	108.7	109.0	24	111.2	111.7	113.8	24	04/03
04/04	107.4	107.8	108.2	23	108.4	109.1	109.9	23	107.9	108.3	108.5	23	112.8	113.3	114.3	23	04/04

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 4/5/2019 7:16:24 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)
03/22/2019	452	142	2	1						65	14
03/23/2019		158	0	3			13,800				26
03/24/2019		157	0	1						80	18
03/25/2019	1,646	114	3	11			35,100				18
03/26/2019	1,060	130		7	1,212					210	30
03/27/2019	816	34	0	3	2,720		24,200				60
03/28/2019	418	33	0	4	3,660					170	48
03/29/2019	476	32	0	12	3,380		8,800				107
03/30/2019		30	1	6	3,480					280	239
03/31/2019		29	9	3	12,951		7,900				173
04/01/2019	124	60	11	5	24,500		6,100	1		1,300	320
04/02/2019	171	50	13	1	31,100	303		7			254
04/03/2019	294		145	1	20,039		5,914	0		2,380	350
04/04/2019	932		168	7	17,721	1,185		2			403
04/05/2019											
<b>Total:</b>	6,389	969	352	65	120,763	1,488	101,814	10	0	4,485	2,060
<b># Days:</b>	10	12	13	14	10	2	7	4	0	7	14
<b>Average:</b>	639	81	27	5	12,076	744	14,545	3	0	641	147
<b>YTD:</b>	10,733	1,223	355	100	120,763	1,488	113,734	10	0	4,945	2,198

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

Date 4/5/2019 7:16:24 AM

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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)
03/22/2019	0	0	0	3						0	468
03/23/2019		0	0	0			0				778
03/24/2019		0	0	5						35	887
03/25/2019	0	0	0	1			0				1,069
03/26/2019	0	0		0	20					40	2,885
03/27/2019	0	0	0	5	200		0				2,552
03/28/2019	0	0	0	3	140					80	3,758
03/29/2019	0	0	3	7	840		0				4,080
03/30/2019		0	0	4	540					0	4,558
03/31/2019		0	0	1	600		0				3,021
04/01/2019	0	0	0	0	2,500		0	63		20	2,522
04/02/2019	0	0	0	1	1,200	0		75			1,357
04/03/2019	0		1	1	0		0	39		10	1,683
04/04/2019	0		0	2	1,074	24		50			1,244
04/05/2019											
Total:	0	0	4	33	7,114	24	0	227	0	185	30,862
# Days:	10	12	13	14	10	2	7	4	0	7	14
Average:	0	0	0	2	711	12	0	57	0	26	2,204
YTD:	1	1	4	61	7,114	24	0	227	0	185	36,027

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

Date 4/5/2019 7:16:24 AM

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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)
03/22/2019	0	0	0	0						0	0
03/23/2019		0	0	0			0				0
03/24/2019		0	0	0						0	9
03/25/2019	0	0	0	3			0				18
03/26/2019	0	0		6	0					20	30
03/27/2019	0	0	0	0	0		0				10
03/28/2019	0	0	0	0	20					0	29
03/29/2019	0	0	0	2	0		0				117
03/30/2019		0	0	2	0					0	269
03/31/2019		0	0	6	700		0				433
04/01/2019	0	0	0	1	200		0	0		0	512
04/02/2019	0	0	17	0	1,700	0		0			543
04/03/2019	0		9	5	0		0	0		0	555
04/04/2019	0		5	3	1,074	0		0			567
04/05/2019											
Total:	0	0	31	28	3,694	0	0	0	0	20	3,092
# Days:	10	12	13	14	10	2	7	4	0	7	14
Average:	0	0	2	2	369	0	0	0	0	3	221
YTD:	0	0	31	28	3,694	0	0	0	0	20	3,292

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

Date 4/5/2019 7:16:24 AM

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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)
03/22/2019	0	5	0	0						5	0
03/23/2019		8	0	3			600				0
03/24/2019		10	0	8						5	0
03/25/2019	1	32	1	18			1,000				18
03/26/2019	0	23		12	1,853					60	0
03/27/2019	0	6	0	15	3,320		200				10
03/28/2019	0	14	2	4	6,100					0	10
03/29/2019	0	32	35	20	5,280		300				10
03/30/2019		14	86	13	8,900					20	0
03/31/2019		20	89	37	19,200		1,050				0
04/01/2019	0	9	64	21	17,800		2,150	0		80	0
04/02/2019	1	226	45	7	27,100	1,000		0			0
04/03/2019	0		13	39	18,060		3,415	0		70	9
04/04/2019	1		39	74	6,981	8,228		0			41
04/05/2019											
Total:	3	399	374	271	114,594	9,228	8,715	0	0	240	98
# Days:	10	12	13	14	10	2	7	4	0	7	14
Average:	0	33	29	19	11,459	4,614	1,245	0	0	34	7
YTD:	3	411	376	272	114,594	9,228	13,411	0	0	265	107

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

Date 4/5/2019 7:16:24 AM

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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)
03/22/2019	0	0	0	0						0	0
03/23/2019		0	0	0			0				0
03/24/2019		0	0	0						0	0
03/25/2019	0	0	0	0			0				0
03/26/2019	0	0		0	10					0	0
03/27/2019	0	0	0	0	0		0				0
03/28/2019	0	0	0	0	0					0	0
03/29/2019	0	0	0	0	20		0				0
03/30/2019		0	0	0	20					0	10
03/31/2019		0	0	0	0		0				10
04/01/2019	0	0	0	0	0		0	0		0	9
04/02/2019	0	0	0	0	0	0		0			18
04/03/2019	0		0	0	0		0	0		0	26
04/04/2019	0		0	0	0	24		0			48
04/05/2019											
Total:	0	0	0	0	50	24	0	0	0	0	121
# Days:	0	0	0	0	5	12	0	0	0	0	9
Average:	0	0	0	0	5	12	0	0	0	0	9
YTD:	0	0	0	0	50	24	8	0	0	0	121

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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## Smolt Monitoring Program Two Week Passage Index Report

Date 4/5/2019 7:16:24 AM

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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)
03/22/2019	0	0	0	0						230	135
03/23/2019		0	0	0			0				130
03/24/2019		20	0	0						29,635	270
03/25/2019	0	0	48	0			0				195
03/26/2019	0	0		0	25					6,410	250
03/27/2019	0	0	0	0	82		0				250
03/28/2019	0	11	18	0	48					1,790	320
03/29/2019	0	1	10	0	15		0				195
03/30/2019		1	4	0	4					1,150	410
03/31/2019		0	2	0	1		150				225
04/01/2019	0	0	0	0	2		2,500	4		1,780	130
04/02/2019	0	0	0	0	2	100		2			100
04/03/2019	0		0	0	0		300	2		660	175
04/04/2019	0		0	0	0	270		1			135
04/05/2019											
<b>Total:</b>	0	33	82	0	179	370	2,950	9	0	41,655	2,920
<b># Days:</b>	10	13	16	14	14	2	7	4	0	13	17
<b>Average:</b>	0	3	5	0	13	185	421	2	0	3,204	172
<b>YTD:</b>		33	82		179	370	3,154	9		42,200	4,125

- 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

Date 4/5/2019 7:16:24 AM

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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:**

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

### 3/22/2019 12:00:00 AM TO 4/5/2019 12:00:00 AM

Date 4/5/2019 7:18:04 AM

Page 1 of 2

#### Lower Granite Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	6,440	105,801	3,020	50	106,750	328,811
Sum of Number Barged	173	10,720	244	0	9,528	30,193
Sum of Number Bypassed	6,239	95,029	2,776	50	97,215	298,524
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	27	7	0	0	3	40
Sum of Facility Morts	1	45	0	0	4	54
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	28	52	0	0	7	94

#### Little Goose Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	10	793	0	10	4,401	9,615
Sum of Number Barged	0	0	0	0	0	0
Sum of Number Bypassed	10	790	0	10	4,400	9,610
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	0	0	0	0	0	0
Sum of Facility Morts	0	3	0	0	1	5
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	0	3	0	0	1	5

FISH PASSAGE CENTER

## Two Week Transportation Summary Report

### 3/22/2019 12:00:00 AM TO 4/5/2019 12:00:00 AM

Date 4/5/2019 7:18:04 AM

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#### Lower Monumental Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	0	100,750	0	0	8,100	116,950
Sum of Number Barged	0	0	0	0	0	0
Sum of Number Bypassed	0	100,748	0	0	8,100	116,948
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	0	2	0	0	0	2
Sum of Facility Morts	0	0	0	0	0	0
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	0	2	0	0	0	2

#### Total

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	6,450	207,344	3,020	60	119,251	455,376
Sum of Number Barged	173	10,720	244	0	9,528	30,193
Sum of Number Bypassed	6,249	196,567	2,776	60	109,715	425,082
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	27	9	0	0	3	42
Sum of Facility Morts	1	48	0	0	5	59
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	28	57	0	0	8	101



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## YTD Transportation Summary Report

Date 4/5/2019 7:17:41 AM

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### Lower Granite Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	6440	105801	3020	50	106750	328811
Sum of Number Barged	173	10720	244	0	9528	30193
Sum of Number Bypassed	6239	95029	2776	50	97215	298524
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	27	7	0	0	3	40
Sum of Facility Morts	1	45	0	0	4	54
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	28	52	0	0	7	94

### Little Goose Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	10	793	0	10	4401	9615
Sum of Number Barged	0	0	0	0	0	0
Sum of Number Bypassed	10	790	0	10	4400	9610
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	0	0	0	0	0	0
Sum of Facility Morts	0	3	0	0	1	5
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	0	3	0	0	1	5

FISH PASSAGE CENTER

## YTD Transportation Summary Report

Date 4/5/2019 7:17:41 AM

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### Lower Monumental Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	0	112670	0	8	12796	138270
Sum of Number Barged	0	0	0	0	0	0
Sum of Number Bypassed	0	112664	0	8	12796	138264
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	0	6	0	0	0	6
Sum of Facility Morts	0	0	0	0	0	0
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	0	6	0	0	0	6

### Total

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	6450	219264	3020	68	123947	476696
Sum of Number Barged	173	10720	244	0	9528	30193
Sum of Number Bypassed	6249	208483	2776	68	114411	446398
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	27	13	0	0	3	46
Sum of Facility Morts	1	48	0	0	5	59
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	28	61	0	0	8	105

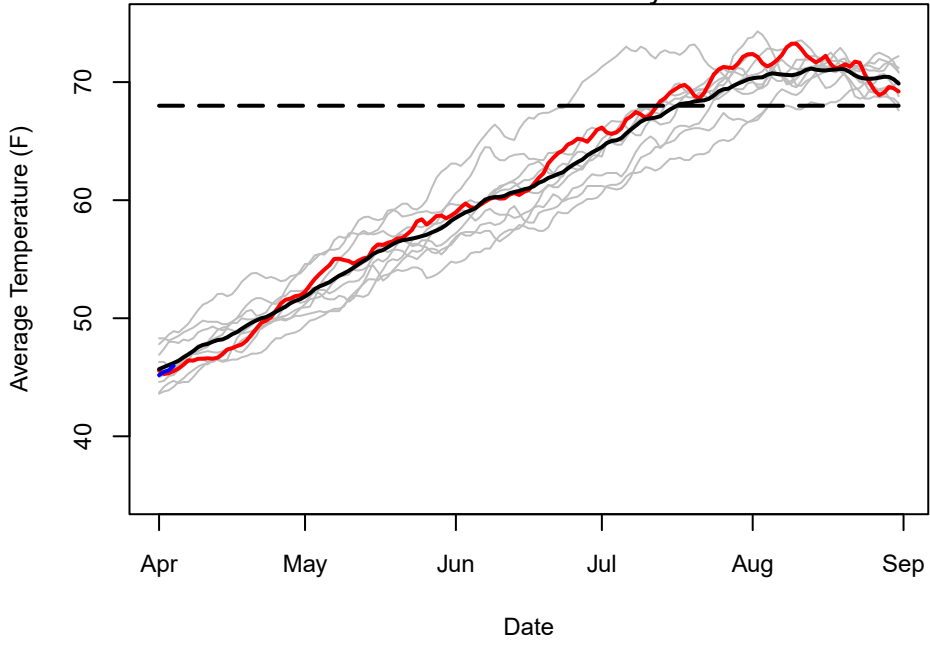
**Cumulative Adult Passage at Mainstem Dams Through: 04/04**

dam	enddate	Spring Chinook						Summer Chinook						Fall Chinook					
		2019		2018		10-Yr Avg.		2019		2018		10-Yr Avg.		2019		2018		10-Yr Avg.	
		Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack
BON	04/04	107	3	38	2	639	0	0	0	0	0	0	0	0	0	0	0	0	0
TDA	04/03	8	0	16	0	94	0	0	0	0	0	0	0	0	0	0	0	0	0
JDA	02/28	7	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0
MCN		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IHR	02/28	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LMN	04/02	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
LGS	04/01	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0
LGR	04/04	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PRD		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WAN		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RIS		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RRH		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WFA	04/03	107	0	19	0	107	0	0	0	0	0	0	0	0	0	0	0	0	0

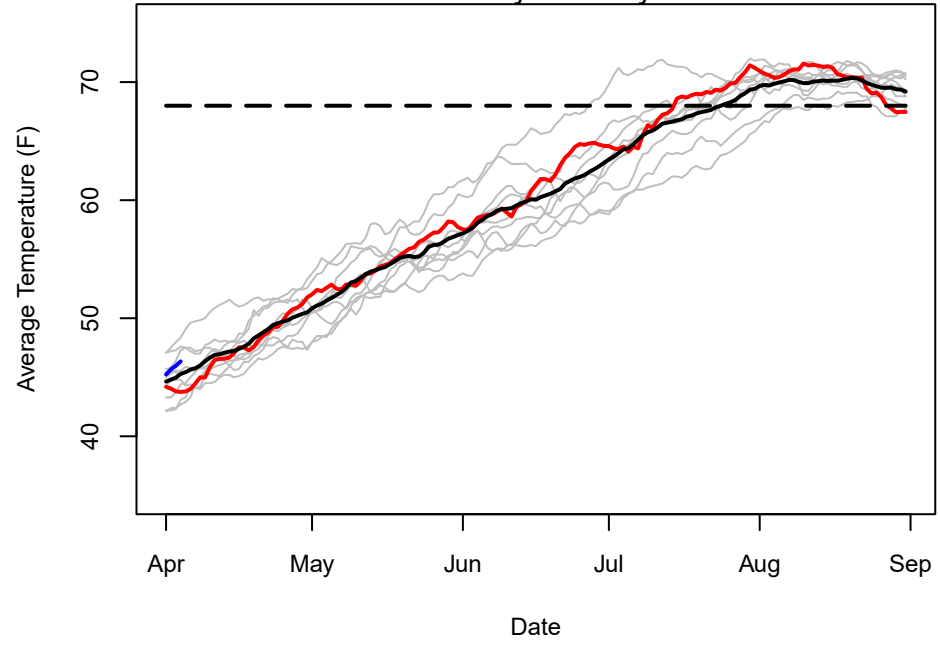
DAM	ENDDATE	Coho						Sockeye			Steelhead						Lamprey		
		2019		2018		10-Yr Avg.		2019	2018	10-Yr Avg.	10-Yr Unclipped		Unclipped		10-Yr Avg.	2019	2018	10-Yr Avg.	
		Adult	Jack	Adult	Jack	Adult	Jack	2019	2018	Avg.	2019	2018	Avg.	2018	2017	Avg.	2019	2018	Avg.
BON	04/04	4	1	1	-1	0	0	0	0	0	1322	1816	2553	708	745	933	-39	0	0
TDA	04/03	0	0	4	0	2	0	0	0	0	46	60	1289	19	23	564	0	0	0
JDA	02/28	18	-12	0	0	0	1	0	0	0	132	0	877	54	0	315	3	0	-1
MCN		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IHR	02/28	1	0	0	0	0	0	0	0	0	182	0	498	58	0	164	0	0	0
LMN	04/02	0	0	0	0	0	0	0	0	0	72	46	5460	33	17	1365	0	0	0
LGS	04/01	0	0	0	0	0	0	0	0	0	42	33	2221	7	7	1105	0	0	0
LGR	04/04	0	0	0	0	0	0	0	0	0	1991	2376	5625	737	539	2065	0	0	0
PRD		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WAN		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RIS		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RRH		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WFA	04/03	0	0	0	2	7	7	0	0	0	2633	1072	3558	2334	1004	106	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.

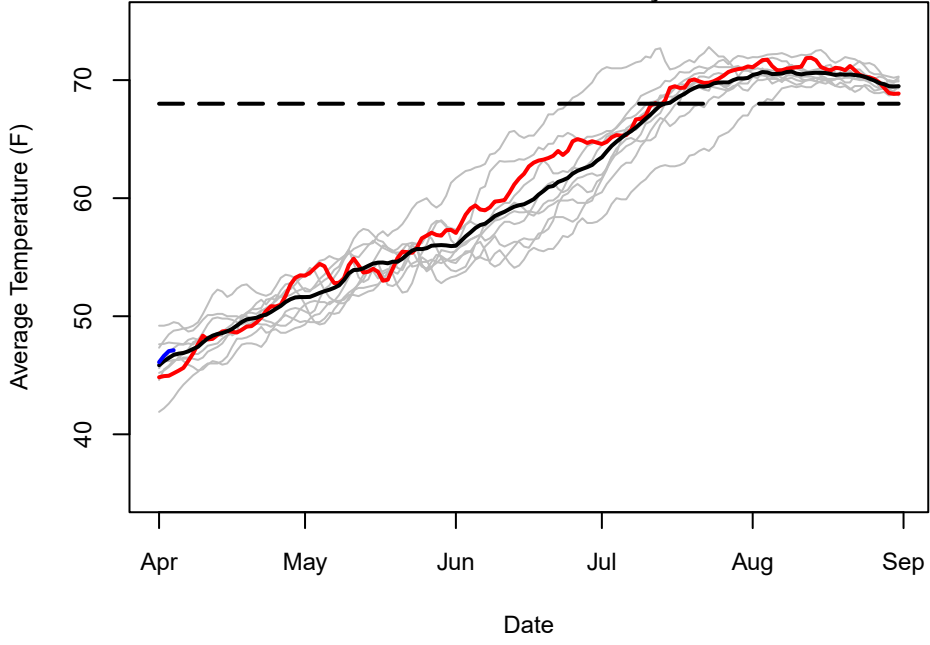
Bonneville Forebay



McNary Forebay



Ice Harbor Forebay



Lower Granite Forebay

