



Fish Passage Center

Weekly Report #18-12

May 24, 2018

This Week's Highlights

Water Supply

Precipitation throughout the Columbia Basin has varied between 16% and 88% of average at individual sub-basins over May. Precipitation above The Dalles has been 74% of average over May. Over the 2018 water year, precipitation has ranged between 90% and 113% of average.

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

Location	Water Year 2018 May 1-24, 2018		Water Year 2018 October 1, 2017 to May 24, 2018	
	Observed (inches)	% Average	Observed (inches)	% Average
	Columbia Above Coulee	1.47	62	29.2
Snake River Above Ice Harbor	1.66	88	16.8	94
Columbia Above The Dalles	1.39	74	20.9	98
Kootenai	0.94	40	28.5	103
Clark Fork	2.02	85	22.1	110
Flathead	1.66	63	30.0	115
Pend Oreille River Basin above Waneta Dam	1.80	73	26.6	109
Salmon River Basin	1.99	88	21.8	98
Upper Snake Tributaries	1.96	86	20.0	99
Clearwater	2.41	80	36.7	113
Willamette River above Portland	0.52	16	52.4	90

Snowpack within the Columbia Basin has been variable. Average snowpack in the Columbia River for basins above the Snake River confluence is 113% of average, for Snake River Basins the average snowpack is 54% of average, and for lower Columbia Basins between

McNary and Bonneville Dam average snowpack is 10% of average.

Table 2 displays the May 25th ESP runoff volume forecasts for multiple reservoirs along with the May COE forecasts at Libby and Dworshak. The May 25th ESP forecast at The Dalles between April and August is 110,255 Kaf (126% of average).

Table 2. May 25 ESP Runoff Volume Forecasts for various reservoirs within the Columbia and Snake River Basins.

Location	May 25, 2018 5-day QPF ESP	
	% Average (1981-2010)	Runoff Volume (Kaf)
The Dalles (Apr-Aug)	126	110,255
Grand Coulee (Apr-Aug)	128	72,836
Libby Res. Inflow, MT (Apr-Aug)	120 125**	7,061 7,556**
Hungry Horse Res. Inflow, MT (Apr-Aug)	157	3,038
Lower Granite Res. Inflow (Apr- July)	122	24,285
Brownlee Res. Inflow (Apr-July)	111	6,063
Dworshak Res. Inflow (Apr-July)	127 124**	3,060 3,032**

* Denotes COE May Forecast

Grand Coulee Reservoir is at 1251.2 feet (5-24-18) and has refilled 11.0 feet over the last week. Outflows at Grand Coulee have ranged between 246.2 Kcfs and 264.6 Kcfs over the last week.

The Libby Reservoir is currently at elevation 2418.1 feet (5-24-18) and has refilled 11.1 feet over the past week. Daily average outflows at Libby Dam have been 14.6-20.0 Kcfs over the last week.

Hungry Horse is currently at an elevation of 3527.4 feet (5-24-18) and has refilled 10.5 feet last week. Outflows

at Hungry Horse have been 4.7-6.5 Kcfs over the last week.

Dworshak is currently at an elevation of 1566.3 feet (5-24-18) and continues to refill, filling 17.4 feet over last week. Dworshak outflows have been 2.2-4.9 Kcfs.

The Brownlee Reservoir was at an elevation of 2042.0 feet on May 10th, 2018 and has refilled 12.0 feet. Outflows at Hells Canyon have ranged between 13.4 and 27.0 Kcfs over the last four days.

The Biological Opinion flow period began on April 3rd in the lower Snake River (Lower Granite). According to the April Final Water Supply Forecast (April 4th, 2018), the flow objective this spring is 100 Kcfs at Lower Granite. Flows at Lower Granite Dam have averaged 152.0 Kcfs last week; over the spring season have averaged 112.5 Kcfs.

Based on the April Final Water Supply Forecast, the Spring Biological Opinion Flow Objectives is 260 Kcfs at McNary Dam and 135 Kcfs at Priest Rapids Dam (both began April 10th). Flows at McNary averaged 494.3 Kcfs last week and 3367.2 Kcfs over the spring season. Flows averaged 349.1 Kcfs at Priest Rapids last week and 244.9 Kcfs over the spring season.

Water Supply Spill

Flows in the Lower Snake River remained high this week and even increased when compared to the previous week. Daily average flows at Lower Granite Dam ranged from 147.6 to 157.6 Kcfs this week. Flows in the Mid-Columbia and Upper Columbia rivers were also high this week. Daily average flows at McNary and Rock Island dams ranged from 492.4 to 501.1 Kcfs and 295.8 to 313.1 Kcfs this week, respectively.

The 2018 spill for fish passage program at the lower Snake River and Mid-Columbia FCRPS projects began just after midnight on April 3rd and April 10th, respectively. In response to the order from the U.S. District Court of the District of Oregon, the 2018 Fish Operations Plan (FOP) specifies that spring spill operations on the Snake and Mid-Columbia rivers will be to spill to the 115%/120% total dissolved gas (TDG) caps at all eight projects. The COE estimates spill

caps for each project on a daily basis and projects will be operated to these estimated spill caps. These daily spill caps are implemented at 1600 each day and are published on the TMT website (<http://pweb.crohms.org/tmt/documents/ops/spill/caps/>). The daily spill caps at the Snake and Mid-Columbia river projects for the past week are summarized in Table 3.

Table 3. Spring spill operations and estimated 115%/120% TDG spill caps at Snake and Mid-Columbia river projects. Estimated spill caps for Snake River projects are for most recent week of spill operations.

Project	Spring Spill Level (Day/Night)	Estimated Spill Caps (5/18-5/24)
Lower Granite	Gas Cap/Gas Cap	31 Kcfs
Little Goose	Gas Cap/Gas Cap	26 Kcfs
Lower Monumental	Gas Cap/Gas Cap	27 Kcfs
Ice Harbor	Gas Cap/Gas Cap	80 Kcfs
McNary	Gas Cap/Gas Cap	145 Kcfs
John Day	Gas Cap/Gas Cap	90 Kcfs
The Dalles	Gas Cap/Gas Cap	90 Kcfs
Bonneville	Gas Cap/Gas Cap	121 Kcfs

The estimated 115%/120% spill cap for Lower Granite Dam (LGR) was 31 Kcfs this week. Due to the high flows this week, spill volumes at LGR have exceeded the estimated 115%/120% spill caps. However, total dissolved gas (TDG) this week never exceeded the 120% waiver limit in the LGR tailrace or the 115% waiver in the Little Goose (LGS) forebay. The estimated spill cap for LGS was 26 Kcfs all of this week. Spill volumes at LGS exceeded the estimated 115%/120% spill cap all of this week. This excess spill is due to flows that were in excess of hydraulic capacity. Total dissolved gas exceeded the 120% waiver limit in the LGS tailrace from May 19th through May 24th. Total dissolved gas in the Lower Monumental (LMN) forebay has exceeded the 115% waiver limit all week and has been as high as 127% (May 20th). The estimated spill cap for LMN was 27 Kcfs this week. Due to flows in excess of hydraulic capacity, spill volumes at LMN have exceeded the estimated spill cap this week. Total dissolved gas in the LMN tailrace have exceeded the 120% waiver limit all of this week. Total dissolved gas in the Ice Harbor (IHR) forebay exceeded the 115% waiver limit all of this week. The estimated spill cap for IHR was 80 Kcfs all of this week. Spill volumes at IHR exceeded the estimated spill cap all of this week, due to flows in excess of hydraulic capacity. Total dissolved gas exceeded the 120% TDG waiver limit in the IHR tailrace all of this week. Total dissolved gas in

the McNary (MCN) forebay exceeded the 115% waiver limit all of this week. However, it is important to note that TDG from spill at IHR is only a portion of what is measured at the MCN forebay, as TDG coming in from the Upper Columbia has been high for most the last three weeks.

Due to flows in excess of hydraulic capacity, spill volumes at the Mid-Columbia projects (McNary, John Day, The Dalles, and Bonneville) has exceeded their respective 115%/120% spill caps since late April. In fact, over the last week, spill at these four projects has been two to three times their respective estimated spill caps. For example, the estimated 115%/120% spill cap at John Day Dam (JDA) has been 90 Kcfs all this week. Spill volumes at JDA have ranged from 270.1 to 285.6 Kcfs this week, which is 3.0 to 3.2 times the estimated cap. The estimated spill cap for McNary Dam (MCN) was 145 Kcfs all of this week. Due to the high flows, spill at MCN has ranged from 334.8 to 342.3 Kcfs this week. The 12-hour average TDG exceeded the 120% waiver limit in the MCN tailrace all this week, with 12-hour average TDG in the 127%-134% range. Total dissolved gas in the John Day (JDA) forebay also exceeded the 115% waiver limit all week, with 12-hour averages in the 130%-133% range. The estimated spill cap for JDA was 90 Kcfs all this week. Due to the high flows, spill at JDA has ranged from 270.1 to 285.6 Kcfs this week. Total dissolved gas exceeded the 120% waiver limit in the JDA tailrace all this week, with 12-hour average TDG in the 132%-134% range. Total dissolved gas in The Dalles (TDA) forebay exceeded the 115% standard all this week, with 12-hour averages in the 128%-131% range. The estimated spill cap for The Dalles Dam was 90 Kcfs all this week. Due to the high flows, spill at TDA ranged from 264.1 to 310.0 Kcfs this week. Total dissolved gas in the tailrace at TDA exceeded the 120% waiver limit all of this week, with 12-hour average TDG in the 125%-127% range. Total dissolved gas in the Bonneville (BON) forebay exceeded the 115% waiver limit all of this week, with 12-hour average TDG in the 123%-129% range. Finally, the estimated spill cap for BON has 121 Kcfs all week. Due to the flows in excess of hydraulic capacity, spill at BON has ranged from 282.8 to 298.1 Kcfs this week. The tailrace monitor at Cascade Island has been out of service since May 13th, likely as a result of the high flows and spill volumes. The 12-hour average TDG at the Warrendale gauge has been in the 129% to 132% range over the past week.

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

Gas bubble trauma (GBT) monitoring in smolts took place over the past week at Lower Granite, Little Goose, Lower Monumental, Rock Island, McNary, and Bonneville dams this week. Signs of GBT were observed in seven of the nine GBT samples conducted this week (May 18-May 24). No signs of GBT were observed at Lower Granite Dam this week. Bonneville observed zero signs of GBT in their sample on May 19th. However, it should be noted that, due to low fish numbers, this GBT sample did not meet the sample size criterion of 100 fish examined. In the sample from May 22nd, eleven fish (11%) had signs of fin GBT. All signs of GBT observed were rank 1 or rank 2. Total dissolved gas in the tailraces of the Mid-Columbia projects (McNary, John Day, and The Dalles) had been at or above 125% for several days prior to May 22nd and TDG in the Bonneville forebay had been at or above 125% since May 19th. These high TDG levels were due to increased spill, as a result of flows in excess of hydraulic capacity. Similarly, Rock Island observed high levels of GBT in their two samples this week. In the samples on May 22nd and May 24th, 43% and 32% of Chinook and steelhead examined had signs of GBT, respectively. As with Bonneville, it should be noted that neither of these GBT samples met the sample size criterion of 100 fish examined. All signs of GBT in the sample from May 22nd were rank 1 or 2. Of the fish

that had signs of fin GBT in the sample from May 24th, one was rank 3 while the rest were rank 1 or 2. Total dissolved gas in the tailraces of the projects above Rock Island have been near or above 130% over the last two weeks and TDG in the Rock Island forebay has been at or above 128% since May 12th. These high TDG levels are due to spill in excess of prescribed levels, as a result of flows in excess of hydraulic capacity. McNary observed three fish (3%) with rank 1 signs of fin GBT in their sample on May 20th and two fish (2%) with rank 1 signs of fin GBT in their sample on May 22nd. Little Goose observed one fish (1.0%) with rank 1 signs of GBT in their sample on May 21st. Lower Monumental observed six fish (6.0%) with rank 1 signs on GBT in their sample on May 23rd. 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. The 15% action criterion was met at Rock Island on May 22nd and May 24th but, due to the high flows in excess of hydraulic capacity, very little can be done to curtail spill above the project.

Temperature

Forebay temperatures are now being reported for Lower Granite, Ice Harbor, McNary and Bonneville dams. Temperatures at these four projects are currently at or slightly above or just at their respective 10-year averages for this time of year.

Smolt Monitoring

Smolt Monitoring Program (SMP) activities continued at all bypass facilities this week. Sampling also continued at two SMP traps this week: the Grand Ronde and Imnaha river traps. Sampling at both the Salmon and Snake river traps has been terminated for the 2018 season.

This week's samples at Bonneville Dam (BON) were dominated by yearling Chinook and sockeye. This week's daily average passage indices for these two species were 16,350 and 15,900 per day, respectively. These are both decreases from last week's daily average passage indices, which were 46,560 for yearling Chinook and 54,050 for sockeye. Steelhead and coho passage also decreased this week, when compared to last week. This week's daily average passage indices for these two species were 3,560 and 6,750 per day, respectively. Last week's daily average passage indices were 6,350 for steelhead and 8,600 for coho. Subyearling Chinook passage this week was similar to last week. This week's daily average passage index for subyearling Chinook at BON was 6,050 per day. Pacific lamprey macropthalmia were encountered every day this week while ammocoetes were only encountered in two of this week's samples (May 20th and 21st). This week's daily average collection for Pacific lamprey macropthalmia was nearly 1,300 per day. While not as high as was observed last week, sockeye smolts experienced elevated mortality rates in several of this week's samples. Daily mortality rates for sockeye ranged from 0.0% to 7.6% this week. In addition, descaling rates were elevated for several samples this week. Daily descaling rates for this week's sockeye samples ranged from 1.7% to 13.2%.

Similar to the last two years, sampling at John Day Dam (JDA) is every-other-day. Yearling Chinook continued to dominate the samples at JDA this week. This week's daily average passage index for yearling Chinook was 32,200 per day, which is a decrease over last week's daily average passage index of 82,000 per day. Steelhead and sockeye passage also decreased this week, when compared to the previous week. This week's daily average passage indices for these two species were 10,600 and 18,200 per day, respectively. Last week's daily average passage indices were 25,900 for steelhead and 43,200 for sockeye. With a daily average passage index of about 8,550 per day,

coho passage this week was very similar to last week. Subyearling Chinook passage increased this week, when compared to the previous week. This week's daily average passage index was about 10,000 per day, whereas that for last week was about 3,900. Similar to last week, a small portion (7%) of the subyearling Chinook encountered this week were smolts and not fry. Pacific lamprey macrophthalmia were encountered in all four of this week's samples while no ammocoetes were encountered this week. This week's daily average collection for Pacific lamprey macrophthalmia at JDA was 24,000 per day, which is an increase from last week's daily average collection of only 8,000.

Similar to John Day, sampling at McNary (MCN) is every-other-day. Yearling Chinook dominated the samples at MCN this week. This week's daily average passage index for yearling Chinook was nearly 30,000 per day, which is a substantial decrease from last week's daily average passage index of 113,500 per day. Sockeye passage also decreased substantially this week, when compared to the previous week. This week's daily average passage index for sockeye at MCN was 22,600 per day, whereas that for last week was about 191,500 per day. Passage of subyearling Chinook, coho, and steelhead also decreased this week, when compared to the previous week. This week's daily average passage indices for these three species were 22,900, 7,300, and 3,050 per day, respectively. Last week's daily average passage indices were 59,200 for subyearling Chinook, 20,500 for coho, and 6,100 for steelhead. Prior to May 9th, all subyearling Chinook encountered at MCN were fry. However, since May 9th, the proportion of the subyearling Chinook sample that are fry has decreased. Of the subyearling Chinook in this week's samples, approximately 76% were fry. Finally, Pacific lamprey macrophthalmia were encountered in all three of this week's samples while no ammocoetes were encountered. This week's daily average collection for Pacific lamprey macrophthalmia was about 21,100 per day, which is an increase over last week's daily average collection of about 18,600 macrophthalmia per day.

Steelhead dominated the samples at Lower Granite Dam (LGR) this week. This week's daily average passage index for steelhead was about 42,300 per day, which is a decrease from last week's daily average passage index of nearly 74,500 per day. Approximately 77% of the steelhead collected at LGR this week

were of hatchery origin. Yearling Chinook, coho, and sockeye passage also decreased this week, when compared to the previous week. This week's daily average passage indices for these three species were 23,800, 7,200, and 10,000 per day, respectively. Last week's daily average passage indices were about 93,100 for yearling Chinook, 8,100 for coho, and 23,700 for sockeye. Subyearling Chinook passage increased again this week, when compared to the previous week. This week's daily average passage index was about 9,700 per day, whereas that for last week was about 4,000. Nearly all (95%) of the subyearling Chinook encountered this week at LGR were smolts. Pacific lamprey macrophthalmia were encountered in all of this week's samples and ammocoetes were encountered in three of this week's samples.

Similar to recent years, sampling at Little Goose Dam (LGS) was every-other-day until the start of transportation (April 23rd), at which time sampling changed to every day. Yearling Chinook dominated this week's samples at LGS. This week's daily average passage index for yearling Chinook was about 25,600 per day, which is a decrease from last week's daily average passage index of about 93,000 per day. Steelhead and coho passage also decreased this week, when compared to the previous week. This week's daily average passage indices for these two species were 22,500 and 5,300 per day, respectively. Last week's daily average passage indices were 52,600 for steelhead and 9,400 for coho. Sockeye passage increased this week, when compared to the previous week. This week's daily average passage index for sockeye at LGS was 10,300 per day, whereas that for last week was 2,300. Subyearling Chinook passage also increased this week. This week's daily average passage index was 3,700 per day. The majority (96%) of the subyearling Chinook encountered in this week's samples were smolts. Finally, Pacific lamprey macrophthalmia and ammocoetes were encountered in five of this week's samples.

Sampling at Lower Monumental Dam (LMN) was every-third-day through April 14th, transitioned to every-other-day through April 23rd, and then transitioned to every day with the start of transportation. This week's samples at LMN were dominated by yearling Chinook. This week's daily average passage index for yearling Chinook was about 17,200 per day, which is a decrease from last week's daily average

passage index of about 41,000 per day. Steelhead passage also decreased this week when compared to last week. This week's daily average passage indices for steelhead was about 12,500 per day, whereas that for last week was 28,300. Sockeye passage increased again this week, when compared to the previous week. This week's daily average passage index for sockeye was nearly 4,500 per day, whereas that for last week was 800 per day. With a daily average passage index of about 800 per day, passage of coho this week was similar to last week. Subyearling Chinook passage increased this week, when compared to the previous week. This week's daily average passage index for subyearling Chinook was about 1,900 per day, whereas that for last week was less than 50 per day. All of the subyearling Chinook encountered at LMN this week were smolts. Finally, Pacific lamprey macrophthalmia were encountered in five of this week's samples and ammocoetes were encountered in only one of this week's samples (May 24th). This week's daily average collection for Pacific lamprey macrophthalmia was about 1,250 per day.

Coho dominated this week's samples at Rock Island Dam (RIS). This week's daily average passage index was 960 per day, which is a decrease from last week's daily average passage index of 2,560 per day. Passage of yearling Chinook, sockeye, and steelhead also decreased this week, when compared to the previous week. This week's daily average passage indices for these three species were 300, 600, and 150 per day, respectively. Last week's daily average passage indices were 1,560 for yearling Chinook, 2,450 for sockeye, and 590 for steelhead. Subyearling Chinook passage this week was very similar to last week. This week's daily average passage index for subyearling Chinook was 240 per day. Finally, Pacific lamprey macrophthalmia were collected in only three of this week's samples and ammocoetes were encountered in four of this week's samples. Compared to last week, sockeye mortality rates this week were relatively low. Daily sockeye mortality rates for this week ranged from 0.0% to 1.5%.

The Snake River Trap at Lewiston, ID (LEW) is located at river kilometer 225 of the Snake River and is operated by the Idaho Department of Fish and Game. Due to high flows and upcoming releases of listed subyearling fall Chinook above the trap, sampling at LEW was terminated after the sample on May 11th.

The Grande Ronde Trap (GRN) is located at river kilometer 2 of the Grande Ronde River and is operated by the Oregon Department of Fish and Wildlife. Yearling Chinook continued to dominate the collections at GRN this week. This week's daily average collection for yearling Chinook at GRN was about 50 per day, which is a decrease from last week's daily average collection of 120 per day. Of the yearling Chinook that were collected this week, approximately 35% were of known hatchery origin. Steelhead collections also decreased this week, when compared to the previous week. This week's daily average collection for steelhead was about 40 per day, whereas that for last week was about 60 per day. Of the steelhead that were collected this week, approximately 53% were clipped. Finally, 35 subyearling Chinook and nearly 250 total coho smolts were encountered in this week's samples. Sampling at GRN is scheduled to end at the end of May.

The Salmon River Trap at Whitebird (WTB) is located at river kilometer 103 of the Salmon River and is operated by the Idaho Department of Fish and Game. Due to high flows, sampling for the 2018 season was terminated after the sample on May 4th.

The Imnaha River Trap (IMN) is located at river kilometer 7 of the Imnaha River and is operated by the Nez Perce Tribe. Sampling at the Imnaha River Trap is year round. For 2018, the FPC currently has data from IMN for the period of February 15 through May 21st. Due to high debris loads, sampling was suspended on one occasion over the last two weeks of available data (May 10th). Steelhead dominated the collections over the last week of available data (May 15-21). The daily average collection for steelhead during this period was about 460 per day, which is a decrease over the previous week's daily average collection of 700 per day. Collections of yearling Chinook also decreased in the most recent week of available data compared to the previous week. The daily average collection for the May 15-21 period was about 20 yearling Chinook per day, whereas that for the previous week was about 40 per day. Finally, one subyearling Chinook was encountered in the sample from May 18th.

Hatchery Releases

FPC has not received preliminary data from some hatcheries as of 05/25/18, therefore, this hatchery release schedule represents the most up to date accounting that are available, but should not be considered a finalized record of hatchery releases.

Snake River Zone:

The Snake River Zone encompasses the Snake River and its tributaries from its confluence with the Columbia River to Hells Canyon Dam. Over the past week there were approximately 1.6 million subyearling fall Chinook released into this zone. Most of these were released into the Snake River (69%), at Pittsburg Landing, and Captain Johns acclimation pond, and at Lyons Ferry Hatchery. The remainder were released at Big Canyon on the Clearwater River (500,000). Additionally, one ongoing release of 156,000 summer Chinook concluded this week in the South Fork Salmon River.

Over the next two weeks there are more than 1.6 million fall Chinook subyearlings scheduled for release into this zone. Most of these are planned releases at the Nez Perce Tribal Hatchery on May 30th (475,000) and June 7th (660,000) into the Clearwater River. Another 200,000 will be released into the Grande Ronde River, and 300,000 are scheduled for the Clearwater River at Lukes Gulch. Finally, there is one scheduled release of approximately 60,000 summer Chinook planned for the Wallowa River on the 1st of June.

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 have been no scheduled releases for this zone. Similarly, there are also no planned releases into this zone over the next two weeks.

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 over 2.3 million fall Chinook released into this zone. Approximately 75% of these were released into the Yakima River, at the Prosser acclimation pond (1.7 million), Roza

acclimation pond (30,000), and directly into the Yakima River (2,000).

Over the next two weeks there will be approximately 7.5 million fall Chinook subyearlings released into this zone. Most of these will be at Klickitat Hatchery (4.0 million), and Ringold Springs Hatchery (3.5 million), but there will also be six smaller releases of 1,000-2,000 fish each into the Yakima River.

Lower Columbia Zone:

The Lower Columbia Zone is defined as the Columbia River and its tributaries below Bonneville Dam. Over the past week there were no scheduled hatchery releases into this zone.

Over the next two weeks there are nearly 2.8 million fall Chinook subyearlings planned for release into this zone. Of these, approximately 69% will be released into the Washougal River at the Washougal Hatchery. The remaining releases are split between the Cowlitz (830,000), Youngs (25,000), and Skipanon Rivers (16,500). Additionally, there are three releases of juvenile coho into this zone over the next two weeks. Of these, most will be released into the Washougal River (150,000), with two smaller releases into the Cowlitz (1,000), and Skipanon Rivers (5,000).

Adult Passage

Adult Passage Adult counts at Bonneville Dam have been updated through 5/24/18. The 2018 adult spring Chinook count at Bonneville Dam of 77,602 is about 1.2 times greater than the 2017 count of 66,458, while being 55.2% of the 10-year average count of 140,499. The 2018 spring Chinook jack count of 5,811 is about 44.3% of the 2017 count of 13,127 and is 25.6% of the 10-year average count of 22,655. At Willamette Falls, 11,750 adult spring Chinook have been counted so far this year. The Willamette Falls adult spring Chinook is 1.4 times greater than the 2017 count, while being 63% of the 10 year average count. As of May 24th, a total of 41,793 adult spring Chinook have been counted at The Dalles Dam and 23,975 have been counted at McNary Dam. The Dalles Dam 2018 adult spring Chinook count is about 1.1 times greater than the 2017 count, while being 39.8% of the 10-year average count. The 2018 McNary Dam adult spring Chinook count is 1.6 times greater than the 2017 count, while being 31.5% of the 10-year average count. A total of 9,769 spring chinook have been counted at Lower Granite Dam as of May 24th.

The 2018 Bonneville Dam adult steelhead count of 3,413 has 398 more fish than the 2017 count of 3,015 and is about 71.3% of the 10-year average count of 4,788. The 2018 Bonneville Dam adult unclipped steelhead count of 1,356 is about 1.4 times the 2017 count of 992 and 89.6% of the 10-year average count of 1,513. At upriver sites, adult steelhead continue to move through the hydrosystem to reach their tributaries and spawning sites. The majority of these fish over-wintered in pools and will complete their trip to their spawning grounds in March through early May. Daily adult steelhead counts at Lower Granite Dam ranged from 1 to 6 adults per day last week. This year's Lower Granite steelhead count of 4,527 is about 62.1% of the 2017 count of 7,290 and 52.1% of the 10-year average count of 8,690. The 2018 Lower Granite Dam adult unclipped steelhead count of 1,257 is 41.4% of the 2017 count of 3,037 and 34.4% of the 10-year average count of 3,648. At Willamette Falls, the 2018 count for steelhead was 3,720 as of May 22nd. This year's steelhead count is about 3.7 times greater than the 2017 count of 1,016, while being 37.1% of the 10-year average count of 10,031.

Hatchery Releases Last Two Weeks

Hatchery Release Summary										
From:			5/12/2018	to	05/25/18					
Agency	Hatchery	Species	Race	MiqYr	NumRel	RelStart	RelEnd	RelSite	RelRiver	Zone
Colville Tribe	Chief Joseph Hatchery	CH1	SU	2018	204,000	05-15-18	05-15-18	Chief Joseph Hatchery	Wells Pool	UCOL
Colville Tribe Total					204,000					
Idaho Dept. of Fish and Game	McCall Hatchery	CH1	SU	2018	156,500	04-02-18	05-20-18	S Fk Salmon River	Salmon River (ID)	SNAK
Idaho Dept. of Fish and Game Total					156,500					
Nez Perce Tribe	Lyons Ferry Hatchery	CH0	FA	2018	400,000	05-22-18	05-22-18	Pittsburg Landing Acclim Pond	Snake River	SNAK
Nez Perce Tribe	Lyons Ferry Hatchery	CH0	FA	2018	500,000	05-21-18	05-21-18	Cpt John Acclim Pond Big Canyon	Snake River	SNAK
Nez Perce Tribe	Lyons Ferry Hatchery	CH0	FA	2018	500,000	05-24-18	05-25-18	(Clearwater River)	Clearwater River M F	SNAK
Nez Perce Tribe Total					1,400,000					
Oregon Dept. of Fish and Wildlife	Bonneville Hatchery	CO	UN	2018	200,000	05-16-18	05-16-18	Tanner Creek	Tanner Creek	LCOL
Oregon Dept. of Fish and Wildlife	Enhancement Program	CO	UN	2018	4,000	05-12-18	05-12-18	Youngs Bay	Youngs River	LCOL
Oregon Dept. of Fish and Wildlife	Irrigon Hatchery Complex	CH0	FA	2018	1,000,000	05-15-18	05-17-18	Salmon River (ID)	Salmon River (ID)	SNAK
Oregon Dept. of Fish and Wildlife	Klaskanine Hatchery	CO	UN	2018	800,000	05-16-18	05-16-18	Klaskanine River	Klaskanine River	LCOL
Oregon Dept. of Fish and Wildlife Total					2,004,000					
Umatilla Tribe	Umatilla Hatchery	CH0	FA	2018	600,000	05-16-18	05-16-18	Reith Bridge	Umatilla River	MCOL
Umatilla Tribe	Umatilla Hatchery	CH0	FA	2018	600,000	05-24-18	05-24-18	Reith Bridge	Umatilla River	MCOL
Umatilla Tribe Total					1,200,000					
Washington Dept. of Fish and Wildlife	Beaver Creek Hatchery	ST	WI	2018	120,000	04-01-18	05-18-18	Beaver Creek	Elochoman River	LCOL
Washington Dept. of Fish and Wildlife	COOP	CT	UN	2018	10,000	04-15-18	05-15-18	Cowlitz River	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Cowlitz Trout	CT	UN	2018	95,000	04-15-18	05-15-18	Blue Creek	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Cowlitz Trout	ST	SU	2018	620,000	04-15-18	05-15-18	Blue Creek	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Cowlitz Trout	ST	WI	2018	53,000	04-15-18	05-15-18	Cowlitz River	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Cowlitz Trout	ST	WI	2018	103,000	04-15-18	05-15-18	Blue Creek	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Cowlitz Trout	ST	WI	2018	470,000	04-15-18	05-15-18	Blue Creek	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Kalama Falls Hatchery	ST	WI	2018	84,000	04-15-18	05-15-18	Kalama Falls Hatchery	Kalama River	LCOL
Washington Dept. of Fish and Wildlife	Lyons Ferry Hatchery	CH0	FA	2018	200,000	05-21-18	05-21-18	Lyons Ferry Hatchery	Snake River	SNAK
Washington Dept. of Fish and Wildlife	Merwin Hatchery	ST	SU	2018	10,000	04-15-18	05-15-18	N Fk Lewis River	Lewis River	LCOL
Washington Dept. of Fish and Wildlife	Merwin Hatchery	ST	WI	2018	247,000	04-15-18	05-15-18	N Fk Lewis River	Lewis River	LCOL
Washington Dept. of Fish and Wildlife	Priest Rapids Hatchery	CH0	FA	2018	7,883,506	05-15-18	06-01-18	Priest Rapids Hatchery	McNary Pool	MCOL
Washington Dept. of Fish and Wildlife	Skamania Hatchery	ST	SU	2018	13,200	04-15-18	05-15-18	Washougal River	Washougal River	LCOL
Washington Dept. of Fish and Wildlife	Skamania Hatchery	ST	SU	2018	20,000	04-15-18	05-15-18	S Fk Toutle River	Toutle River	LCOL
Washington Dept. of Fish and Wildlife	Skamania Hatchery	ST	WI	2018	20,000	04-15-18	05-15-18	Rock Cr (Stevenson)	Bonneville Pool	MCOL
Washington Dept. of Fish and Wildlife	Tucannon Hatchery	ST	SU	2018	50,000	04-30-18	05-15-18	Curl Lake Acclim Pond	Tucannon River	SNAK
Washington Dept. of Fish and Wildlife Total					9,998,706					
Yakama Tribe	Cle Elem Hatchery	CH1	SP	2018	218,712	03-15-18	05-15-18	Easton Pond Jack Creek Acclim Pond	Yakima River	MCOL
Yakama Tribe	Cle Elem Hatchery	CH1	SP	2018	220,160	03-15-18	05-15-18		Yakima River	MCOL
Yakama Tribe	Cle Elem Hatchery	CH1	SP	2018	230,627	03-15-18	05-15-18	Clark Flat Acclim Pond	Yakima River	MCOL
Yakama Tribe	Prosser Acclim. Pond	CH0	FA	2018	2,000	05-25-18	05-25-18	Yakama River	Yakima River	MCOL
Yakama Tribe	Prosser Acclim. Pond	CH0	FA	2018	30,000	05-25-18	05-25-18	Roza Acclim Pond	Yakima River	MCOL
Yakama Tribe	Prosser Acclim. Pond	CH0	FA	2018	37,276	05-17-18	05-17-18	Wapatox Sampling	Yakima River	MCOL
Yakama Tribe	Prosser Acclim. Pond	CH0	FA	2018	1,700,000	05-20-18	05-20-18	Prosser Acclim Pond	Yakima River	MCOL
Yakama Tribe Total					2,438,775					
Grand Total					17,401,981					

Hatchery Releases Next Two Weeks

Hatchery Release Summary										
From:	5/26/2018		to		6/8/2018					
Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver	Zone
Nez Perce Tribe	Lyons Ferry Hatchery	CH0	FA	2018	300,000	06-07-18	06-07-18	Lukes Gulch Acclim. Nez Perce Tribal Hatchery	S Fk Clearwater River	SNAK
Nez Perce Tribe	Lyons Ferry Hatchery	CH0	FA	2018	475,000	05-30-18	05-31-18	Nez Perce Tribal Hatchery	Clearwater River M F	SNAK
Nez Perce Tribe	Lyons Ferry Hatchery	CH0	FA	2018	660,000	06-07-18	06-08-18	Hatchery	Clearwater River M F	SNAK
Nez Perce Tribe Total					1,435,000					
Oregon Dept. of Fish and Wildlife	Enhancement Program	CH0	FA	2018	16,500	06-01-18	06-01-18	Skipanon River	Col R Bel. Bon Dam	LCOL
Oregon Dept. of Fish and Wildlife	Enhancement Program	CH0	FA	2018	25,000	06-01-18	06-01-18	Youngs Bay	Youngs River	LCOL
Oregon Dept. of Fish and Wildlife	Enhancement Program	CO	UN	2018	5,000	06-01-18	06-01-18	Skipanon River	Col R Bel. Bon Dam	LCOL
Oregon Dept. of Fish and Wildlife	Irrigon Hatchery Complex	CH0	FA	2018	200,000	05-31-18	05-31-18	Grande Ronde River	Grande Ronde River	SNAK
Oregon Dept. of Fish and Wildlife Total					246,500					
Washington Dept. of Fish and Wildlife	COOP	CO	NO	2018	1,000	06-01-18	06-01-18	Campbell Creek	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Cowlitz Salmon	CH0	FA	2018	1,581,000	05-01-18	06-01-18	Cowlitz Hatchery	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Cowlitz Salmon	CH0	FA	2018	2,093,500	05-01-18	06-01-18	Cowlitz Hatchery	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Lyons Ferry Hatchery	ST	SU	2018	60,000	06-01-18	06-01-18	Lyons Ferry Hatchery	Snake River	SNAK
Washington Dept. of Fish and Wildlife	Merwin Hatchery	ST	WI	2018	104,000	05-01-18	06-01-18	N Fk Lewis River	Lewis River	LCOL
Washington Dept. of Fish and Wildlife	North Toutle Hatchery	CH0	FA	2018	830,000	06-01-18	07-01-18	Green River	Cowlitz River	LCOL
Washington Dept. of Fish and Wildlife	Priest Rapids Hatchery	CH0	FA	2018	7,883,506	05-15-18	06-01-18	Priest Rapids Hatchery Ringold Springs Hatchery	McNary Pool	MCOL
Washington Dept. of Fish and Wildlife	Ringold Springs Hatchery	CH0	FA	2018	3,500,000	06-01-18	06-01-18	Hatchery	McNary Pool	MCOL
Washington Dept. of Fish and Wildlife	Washougal Hatchery	CH0	FA	2018	1,900,000	06-01-18	06-01-18	Washougal Hatchery	Washougal River	LCOL
Washington Dept. of Fish and Wildlife	Washougal Hatchery	CO	NO	2018	150,000	05-01-18	06-01-18	Washougal River	Washougal River	LCOL
Washington Dept. of Fish and Wildlife Total					18,103,006					
Yakama Tribe	Klickitat Hatchery	CH0	FA	2018	4,000,000	06-01-18	06-01-18	Klickitat Hatchery	Klickitat River	MCOL
Yakama Tribe	Prosser Acclim. Pond	CH0	FA	2018	1,000	05-30-18	05-30-18	Yakama River	Yakima River	MCOL
Yakama Tribe	Prosser Acclim. Pond	CH0	FA	2018	1,000	06-05-18	06-05-18	Yakama River	Yakima River	MCOL
Yakama Tribe	Prosser Acclim. Pond	CH0	FA	2018	2,000	05-30-18	05-30-18	Prosser Acclim Pond	Yakima River	MCOL
Yakama Tribe	Prosser Acclim. Pond	CH0	FA	2018	2,000	05-30-18	05-30-18	Yakama River	Yakima River	MCOL
Yakama Tribe	Prosser Acclim. Pond	CH0	FA	2018	2,000	06-05-18	06-05-18	Prosser Acclim Pond	Yakima River	MCOL
Yakama Tribe	Prosser Acclim. Pond	CH0	FA	2018	2,000	06-05-18	06-05-18	Yakama River	Yakima River	MCOL
Yakama Tribe Total					4,010,000					
Grand Total					23,794,506					

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

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

Date	Grand Coulee		Chief Joseph		Wells		Rocky Reach		Rock Island		Wanapum		Priest Rapids	
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
05/11/2018	238.9	37.3	239.7	111.2	277.6	115.8	283.3	125.6	280.9	143.5	309.7	175.8	308.6	186.1
05/12/2018	260.8	61.0	268.5	142.1	295.5	137.3	316.9	155.9	302.9	171.9	340.4	216.9	345.6	207.5
05/13/2018	283.2	81.9	295.4	148.5	313.1	159.4	335.2	178.3	317.7	193.8	363.0	245.2	371.2	231.6
05/14/2018	282.5	82.2	292.3	140.1	323.9	185.2	337.0	204.8	325.9	206.8	375.2	249.7	387.6	241.7
05/15/2018	270.2	72.6	278.3	140.5	319.2	173.5	329.3	193.3	318.2	198.2	363.4	241.7	374.7	231.0
05/16/2018	248.8	49.1	253.9	140.2	303.8	160.4	312.1	167.2	307.8	180.9	351.2	227.9	361.9	237.7
05/17/2018	245.0	45.9	255.1	147.7	300.3	158.4	306.6	159.0	306.5	182.4	333.4	229.1	338.1	205.2
05/18/2018	249.5	41.0	252.0	126.1	301.2	158.9	315.5	176.6	308.5	203.1	355.9	239.1	361.1	213.1
05/19/2018	246.2	36.0	252.1	112.8	297.2	152.2	304.5	154.5	295.8	161.2	334.1	201.6	337.4	197.9
05/20/2018	250.0	38.4	258.8	114.4	301.2	158.1	312.3	172.9	302.9	169.4	346.6	214.4	352.5	210.5
05/21/2018	258.6	48.7	267.9	133.0	303.2	154.8	306.4	157.8	299.1	165.8	337.2	208.6	342.4	201.4
05/22/2018	264.6	61.0	271.4	151.0	316.9	167.7	321.4	179.7	313.1	180.4	350.0	219.2	353.1	204.7
05/23/2018	263.3	46.3	268.0	152.3	311.0	162.8	315.0	159.9	305.6	175.7	344.1	221.7	351.1	208.4
05/24/2018	251.4	31.8	255.4	138.0	295.3	148.5	304.2	149.9	299.8	167.8	337.9	231.0	345.8	213.7

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

Date	Dworshak		Brownlee Inflow	Hells Canyon		Lower Granite		Little Goose		Lower Monumental		Ice Harbor	
	Flow	Spill		Outflow	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	
05/11/2018	2.4	0.0	---	---	155.4	51.3	150.8	64.9	151.4	72.0	155.8	101.5	
05/12/2018	2.4	0.1	---	---	139.4	44.4	134.4	52.3	134.9	46.2	144.7	90.8	
05/13/2018	2.4	0.1	---	---	126.1	33.6	120.2	40.5	117.3	30.4	124.2	80.4	
05/14/2018	2.4	0.0	---	---	118.8	32.4	113.7	29.0	112.8	37.6	119.9	79.8	
05/15/2018	2.4	0.0	---	---	124.4	31.1	120.0	33.5	119.0	42.3	124.6	81.6	
05/16/2018	2.4	0.0	---	---	133.8	31.1	126.6	36.7	124.2	42.8	134.1	84.8	
05/17/2018	2.3	0.0	---	---	147.4	39.3	142.1	52.2	141.9	52.8	147.9	92.3	
05/18/2018	2.3	0.2	---	---	153.2	44.3	146.1	55.7	143.4	54.6	150.6	95.2	
05/19/2018	2.3	0.0	---	---	152.9	43.3	148.2	72.6	147.3	59.1	154.2	99.6	
05/20/2018	2.3	0.0	---	---	150.0	42.2	142.9	52.9	142.0	53.6	149.7	94.8	
05/21/2018	3.5	1.2	---	---	148.2	41.8	143.2	53.1	140.9	52.2	147.3	92.1	
05/22/2018	4.9	2.6	---	---	147.6	38.9	142.0	51.7	141.2	52.5	148.4	94.0	
05/23/2018	4.7	1.3	---	---	154.8	46.3	151.0	60.8	148.3	59.7	156.2	101.6	
05/24/2018	4.5	0.0	---	---	157.6	49.4	149.1	58.9	148.0	60.3	154.2	99.5	

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

Date	McNary		John Day		The Dalles		Bonneville			
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	PH1	PH2
05/11/2018	451.1	309.8	456.7	246.9	434.0	254.7	448.4	228.8	66.5	140.6
05/12/2018	488.4	344.5	489.3	270.2	469.5	297.4	474.0	257.3	65.3	138.9
05/13/2018	477.2	339.5	486.0	262.5	470.8	302.3	486.0	271.0	64.7	137.8
05/14/2018	474.1	362.9	481.0	257.8	460.7	292.1	468.3	269.5	64.7	121.8
05/15/2018	490.2	369.8	487.1	265.7	467.8	293.7	465.7	285.6	63.6	104.1
05/16/2018	497.6	361.5	494.8	275.5	480.8	295.7	495.6	310.6	64.4	108.2
05/17/2018	493.7	335.2	498.6	285.1	479.4	281.2	489.3	294.6	61.6	120.7
05/18/2018	497.5	335.2	500.6	285.5	483.0	270.0	493.4	298.1	63.7	119.2
05/19/2018	497.0	334.8	500.1	285.6	480.0	270.0	489.9	295.0	63.5	119.1
05/20/2018	492.4	335.1	500.2	285.5	480.0	270.0	483.8	285.6	63.6	122.2
05/21/2018	489.9	334.9	500.4	284.3	482.0	270.0	489.7	290.2	64.8	122.4
05/22/2018	488.0	335.0	493.5	280.5	479.0	264.1	486.5	293.0	58.1	122.9
05/23/2018	494.4	335.3	497.6	270.1	472.8	290.9	474.5	282.8	53.7	125.6
05/24/2018	501.1	342.3	497.5	270.2	479.4	310.0	489.8	290.4	58.6	128.3

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

Site	Date & Species	Number of Fish	Number w/ GBT signs	Number w/ Fin Signs	% Fin GBT	% Severe Fin GBT	Number of Fish with Fin GBT Listed by Highest Rank			
							Rank 1	Rank 2	Rank 3	Rank 4
Lower Granite Dam										
	05/17/18 Chinook + Steelhead	103	1	1	0.97%	0.00%	1	0	0	0
	05/24/18 Chinook + Steelhead	101	0	0	0.00%	0.00%	0	0	0	0
Little Goose Dam										
	05/14/18 Chinook + Steelhead	100	1	1	1.00%	0.00%	1	0	0	0
	05/21/18 Chinook + Steelhead	100	1	1	1.00%	0.00%	1	0	0	0
Lower Monumental Dam										
	05/16/18 Chinook + Steelhead	100	2	2	2.00%	0.00%	2	0	0	0
	05/23/18 Chinook + Steelhead	100	6	6	6.00%	0.00%	6	0	0	0
McNary Dam										
	05/12/18 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	05/14/18 Chinook + Steelhead	100	0	0	0.00%	0.00%	0	0	0	0
	05/20/18 Chinook + Steelhead	100	3	3	3.00%	0.00%	1	2	0	0
	05/22/18 Chinook + Steelhead	100	2	2	2.00%	0.00%	1	1	0	0
Bonneville Dam										
	05/12/18 Chinook + Steelhead	100	3	3	3.00%	0.00%	3	0	0	0
	05/15/18 Chinook + Steelhead	100	17	17	17.00%	0.00%	16	1	0	0
	05/19/18 Chinook + Steelhead	29*	0	0			0	0	0	0
	05/22/18 Chinook + Steelhead	100	11	11	11.00%	0.00%	9	2	0	0
Rock Island Dam										
	05/15/18 Chinook + Steelhead	100	35	32	32.00%	0.00%	25	7	0	0
	05/17/18 Chinook + Steelhead	100	38	36	36.00%	0.00%	34	2	0	0
	05/22/18 Chinook + Steelhead	95*	42	41			35	6	0	0
	05/24/18 Chinook + Steelhead	88*	28	28			23	4	1	0

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

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

FISH PASSAGE CENTER

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

[INTERNAL PURPOSES ONLY]

Date 5/25/2018 7:15:10 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	
05/11									112.0	112.5	113.3	24	124.0	126.3	129.4	24	115.2	115.8	115.6	24	123.7	124.9	125.4	24	05/11
05/12									112.7	113.3	114.5	24	131.6	133.4	137.0	24	120.3	123.3	125.8	24	126.8	128.0	128.7	24	05/12
05/13									113.6	113.7	114.1	24	136.7	137.1	137.5	24	129.3	131.0	132.8	24	128.3	128.8	129.3	24	05/13
05/14									114.4	114.7	115.1	24	137.5	138.2	138.4	24	135.1	135.9	136.0	24	128.4	128.8	129.3	24	05/14
05/15									115.8	116.1	116.3	24	138.0	138.2	139.5	24	136.5	137.3	137.6	24	128.3	128.6	128.6	24	05/15
05/16									117.3	117.7	119.1	24	135.0	137.8	137.4	24	137.1	137.6	138.2	24	127.3	128.2	128.6	24	05/16
05/17									117.7	117.9	118.2	24	134.6	134.7	135.0	24	134.7	137.0	136.1	24	127.6	128.2	129.0	24	05/17
05/18									117.5	117.8	117.9	24	133.9	134.5	134.6	24	131.9	133.2	132.3	24	126.1	128.4	128.2	24	05/18
05/19									118.6	119.1	119.6	24	133.5	134.0	134.3	24	132.6	133.1	133.5	24	125.4	125.8	126.2	24	05/19
05/20									120.2	120.7	120.9	24	135.0	135.9	136.5	24	132.8	133.3	133.7	24	125.7	126.1	126.4	24	05/20
05/21									120.7	120.9	121.0	24	137.5	138.5	138.9	24	133.4	134.1	134.5	24	127.1	127.8	128.5	24	05/21
05/22									121.0	121.3	121.6	24	138.1	138.7	139.6	24	135.7	136.6	137.3	24	128.2	128.6	129.4	24	05/22
05/23									122.0	122.3	122.6	24	136.7	138.7	138.5	24	137.3	137.7	138.3	24	128.2	128.7	130.1	24	05/23
05/24									121.6	122.2	121.9	23	132.9	135.7	136.7	23	135.3	137.5	136.5	23	126.8	128.3	128.8	23	05/24

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	
05/11	114.6	115.8	116.2	24	127.0	128.5	129.3	24	121.2	122.1	124.6	24	133.4	134.8	136.5	22	122.7	124.5	124.6	22	129.2	131.3	131.6	21	05/11
05/12	117.9	119.6	120.6	24	130.1	131.3	131.5	24	126.6	128.1	128.7	24	136.5	137.7	138.8	22	127.7	128.8	129.3	23	133.3	133.9	134.3	22	05/12
05/13	122.4	124.0	124.6	24	134.1	135.8	136.6	24	129.3	130.2	131.8	24	135.1	136.3	137.8	23	128.6	129.5	130.1	24	133.7	134.4	135.6	23	05/13
05/14	125.4	126.8	127.5	22	137.4	138.5	139.9	22	133.7	134.8	135.8	24	135.8	136.9	137.7	20	131.0	131.3	132.7	22	136.4	136.7	137.3	18	05/14
05/15	126.3	126.9	127.4	24	136.8	138.3	137.5	24	136.1	136.4	136.7	24	134.7	136.1	135.6	22	131.7	132.2	132.5	23	136.6	136.9	137.2	22	05/15
05/16	125.6	126.9	126.2	24	136.5	137.2	137.5	24	135.4	136.4	136.3	24	133.7	134.0	135.1	22	130.4	131.8	131.4	24	136.0	136.8	136.5	21	05/16
05/17	123.6	125.8	124.7	24	136.1	136.3	137.3	24	134.6	135.7	135.5	24	133.8	134.4	135.8	24	129.0	130.3	131.1	24	134.4	135.9	135.8	24	05/17
05/18	122.2	123.2	122.7	24	134.8	136.1	136.4	24	133.8	135.1	135.3	23	132.8	133.8	134.6	20	129.5	129.8	131.1	21	135.9	135.9	136.2	20	05/18
05/19	122.7	123.5	123.8	24	134.4	134.7	135.3	24	134.1	134.4	135.0	24	132.9	133.2	133.8	21	129.2	129.7	130.0	23	135.4	135.7	136.1	21	05/19
05/20	123.9	124.6	125.1	24	135.5	136.0	136.7	24	134.3	135.2	135.9	24	133.4	134.2	134.6	24	130.0	130.5	131.1	24	135.9	136.3	136.9	24	05/20
05/21	124.1	125.1	125.5	24	135.4	135.8	136.6	24	134.5	135.4	135.6	24	133.5	134.2	135.1	23	129.8	130.6	131.1	24	135.7	136.5	136.4	23	05/21
05/22	125.4	126.3	126.6	24	136.4	136.9	137.4	24	134.7	135.6	136.5	24	134.5	134.9	136.2	24	130.3	131.4	132.5	24	135.8	136.3	136.7	23	05/22
05/23	126.3	126.9	127.6	24	136.6	137.0	137.8	24	135.3	135.8	136.0	24	134.5	135.6	135.6	22	130.8	131.4	131.6	23	136.1	136.4	136.4	22	05/23
05/24	125.5	126.6	126.4	23	135.7	136.9	137.0	23	134.2	135.5	135.1	23	133.7	134.6	135.9	23	130.0	130.7	131.7	23	135.2	136.0	136.4	23	05/24

FISH PASSAGE CENTER

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

[INTERNAL PURPOSES ONLY]

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Total Dissolved Gas Data at Upper and Mid-Columbia Sites

Date	Wanapum				Wanapum Tlwr				Priest Rapids				Priest R. Dnstr				Pasco				Date
	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	
05/11	121.1	122.3	123.3	24	129.6	130.9	133.7	24	123.9	126.8	127.5	24	123.5	125.1	125.8	24					05/11
05/12	125.4	127.2	128.2	24	136.6	137.5	140.4	24	131.8	133.8	134.3	24	128.1	129.4	129.7	24					05/12
05/13	130.3	131.3	132.1	24	140.9	141.1	141.5	24	136.8	138.2	138.6	24	130.4	131.3	131.8	24					05/13
05/14	132.0	133.2	134.2	24	141.0	141.4	142.7	24	137.9	138.3	139.0	24	131.6	131.7	131.8	4					05/14
05/15	134.3	134.8	135.8	24	142.3	142.4	142.5	24	139.5	140.0	140.4	24				0					05/15
05/16	133.6	134.8	134.5	24	141.9	142.2	142.3	24	138.0	139.7	139.0	24	132.0	132.1	132.4	15					05/16
05/17	131.8	133.2	133.5	24	140.5	141.8	142.0	24	137.1	138.4	139.2	24	130.4	132.1	131.9	24					05/17
05/18	130.2	131.4	131.3	24	139.3	140.8	141.9	24	136.4	137.9	138.0	24	130.6	131.3	131.3	24					05/18
05/19	131.8	132.6	133.0	24	136.8	138.3	138.8	24	134.7	136.4	136.9	24	129.3	130.5	130.0	24					05/19
05/20	132.0	132.7	133.4	24	138.8	138.9	139.3	24	136.0	136.5	136.9	24	130.2	130.5	130.8	24					05/20
05/21	131.6	133.0	133.7	24	138.3	139.0	139.2	24	134.9	136.1	136.7	24	129.6	130.5	130.8	24					05/21
05/22	133.6	134.5	134.9	24	139.5	140.0	141.1	24	137.2	138.0	139.0	24	131.0	131.7	131.9	24					05/22
05/23	134.2	135.0	136.5	24	140.0	141.0	141.3	24	137.8	138.7	139.4	24	131.7	132.2	132.7	24					05/23
05/24	132.2	133.8	133.3	24	139.5	140.2	141.0	24	135.9	137.3	138.1	24	130.1	131.4	131.3	24					05/24

Total Dissolved Gas Data at Snake and Clearwater Sites

Date	Dworshak				Clrwr Peck				Anatone				Clrwr-Lewiston				Lower Granite				Lower G. Tlwr				Date
	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	
05/11	99.8	100.4	100.9	24	102.1	104.0	103.2	24	106.7	107.0	107.2	24	102.7	103.6	103.4	24	104.7	105.0	105.1	24	119.8	121.0	120.8	24	05/11
05/12	101.0	102.4	104.8	24	100.5	101.9	101.2	24	106.9	107.6	108.4	24	103.3	104.2	105.0	24	105.7	106.2	106.4	24	118.1	119.3	120.2	24	05/12
05/13	101.8	103.4	106.6	24	98.6	100.6	100.0	24	106.0	107.4	107.4	24	102.8	104.1	104.0	24	106.3	106.5	106.8	24	115.5	117.6	119.8	24	05/13
05/14	101.0	102.3	102.8	24	97.6	98.7	98.3	24	105.8	106.6	107.4	24	102.9	103.8	104.4	24	106.2	106.7	106.8	24	115.1	115.4	115.7	24	05/14
05/15	101.3	102.4	103.2	24	100.4	103.7	105.6	24	105.8	106.6	107.2	24	103.1	103.8	104.4	24	105.9	106.1	106.3	24	114.6	115.1	115.0	24	05/15
05/16	100.7	101.9	101.5	23	103.5	104.8	104.8	24	105.6	106.5	106.7	24	102.2	103.8	102.9	24	105.6	106.1	106.2	24	114.5	114.8	114.7	24	05/16
05/17	100.7	101.1	101.6	24	103.7	104.3	104.5	24	105.7	106.0	106.4	24	102.5	102.7	103.2	24	104.5	105.4	105.5	24	116.5	117.3	118.0	24	05/17
05/18	100.8	101.3	104.9	24	103.4	104.2	103.8	24	106.3	106.9	107.5	24	102.4	102.8	103.1	24	104.3	104.5	104.7	24	117.7	118.0	118.1	24	05/18
05/19	102.3	102.9	106.5	24	104.1	105.1	105.6	24	107.1	107.9	108.5	24	103.0	103.8	104.4	24	104.8	105.3	105.9	24	117.7	118.1	118.3	24	05/19
05/20	101.2	101.9	102.8	24	103.7	105.0	104.7	24	107.0	107.8	107.7	24	102.8	103.8	103.7	24	105.8	106.2	106.6	24	117.8	118.4	120.6	24	05/20
05/21	104.4	108.1	109.7	24	103.8	104.8	105.3	24	107.0	107.6	108.2	24	102.8	103.5	104.0	24	105.9	106.4	106.4	24	117.7	118.4	120.1	24	05/21
05/22	110.2	111.0	111.9	24	104.8	105.9	106.7	24	107.8	108.7	109.5	24	103.6	104.4	105.0	24	106.0	106.4	106.8	24	117.0	118.1	118.2	24	05/22
05/23	106.9	111.0	112.1	24	104.7	105.9	105.6	24	107.5	108.6	108.3	24	103.4	104.4	104.3	24	106.8	107.1	107.5	24	118.8	119.9	121.9	24	05/23
05/24	101.0	102.1	102.1	23	104.0	105.0	105.6	23	107.2	107.8	108.5	23	102.8	103.7	103.6	23	105.9	107.1	106.9	23	119.2	119.7	119.4	23	05/24

FISH PASSAGE CENTER

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

[INTERNAL PURPOSES ONLY]

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Total Dissolved Gas Data at Lower Snake Sites

Date	Little Goose				L. Goose Tlwr				Lower Mon.				Lwr. Mon. Tlwr				Ice Harbor				Tlwr Ice Harbor				Date
	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	
05/11	110.6	111.1	111.9	24	122.3	123.5	122.9	24	120.4	122.3	123.2	24	123.4	126.8	127.1	24	119.0	119.9	120.8	24	122.5	124.6	124.0	24	05/11
05/12	114.6	115.8	116.7	24	119.7	122.6	121.4	24	123.6	124.4	124.6	24	119.3	120.8	121.2	24	121.5	121.7	122.1	24	121.2	122.1	122.4	24	05/12
05/13	115.5	116.1	116.2	24	117.1	118.6	119.4	24	123.1	124.5	124.3	24	115.6	117.9	118.7	24	121.3	121.7	121.8	24	119.2	120.1	119.7	24	05/13
05/14	115.1	115.5	116.2	24	115.4	116.8	116.7	24	119.5	122.3	121.4	24	117.0	119.1	120.1	24	120.4	121.3	120.9	24	119.0	119.1	119.4	24	05/14
05/15	113.8	114.8	114.2	24	116.0	117.5	119.6	24	118.0	119.5	119.4	24	118.6	119.2	120.5	24	119.6	120.6	120.4	24	119.4	119.8	121.0	24	05/15
05/16	113.2	113.8	113.8	24	116.2	117.7	118.2	24	115.9	117.6	117.5	24	118.5	119.8	121.0	24	118.1	119.5	119.3	24	120.2	120.5	121.0	24	05/16
05/17	111.5	112.8	112.6	24	118.9	119.3	120.1	24	116.4	117.0	117.7	24	120.6	121.0	121.8	24	116.3	117.5	116.9	24	121.2	121.5	121.8	24	05/17
05/18	110.6	111.2	111.7	24	119.9	120.0	120.3	24	119.6	120.7	120.9	24	120.8	120.9	121.3	24	117.2	117.5	117.8	24	121.4	121.6	122.0	24	05/18
05/19	112.1	112.6	113.1	24	123.2	125.8	126.9	24	121.1	121.6	122.2	24	120.8	120.9	121.6	24	118.7	119.5	120.2	24	122.4	123.2	123.3	24	05/19
05/20	113.7	114.3	114.7	24	120.0	122.8	120.5	24	125.1	126.9	127.8	24	121.0	121.4	122.6	24	120.3	120.4	120.6	24	121.5	121.9	122.2	24	05/20
05/21	113.6	114.3	114.1	24	120.0	120.5	121.2	24	121.1	125.3	122.1	24	121.0	121.4	124.0	24	120.7	121.2	121.5	24	121.2	122.0	122.2	24	05/21
05/22	114.0	114.2	114.5	24	120.1	120.6	120.8	24	121.4	121.9	122.8	24	121.2	121.5	122.3	24	120.3	121.2	120.8	24	121.5	122.2	122.5	24	05/22
05/23	114.6	114.9	115.2	24	121.8	123.3	124.0	24	121.7	122.6	123.1	24	126.1	128.0	129.1	24	120.5	120.8	120.9	24	122.8	123.8	124.4	24	05/23
05/24	113.3	114.4	114.2	23	121.3	123.3	121.8	23	122.2	123.1	123.8	23	125.0	130.4	131.6	23	119.5	120.3	120.0	23	122.5	124.1	124.2	23	05/24

Total Dissolved Gas Data at Mid-Columbia Sites

Date	McNary-Wash.				Tlwr McNary				John Day				Tlwr John Day				The Dalles				Dnstr T. Dalles				Date
	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	
05/11	116.1	117.3	117.9	24	125.4	126.6	127.0	24	114.8	116.9	115.7	24	127.5	128.2	128.6	24	119.4	121.2	122.3	24	121.4	122.4	122.9	24	05/11
05/12	117.9	118.7	119.1	24	128.2	129.3	131.8	24	116.4	117.6	118.4	24	131.2	132.4	132.9	24	124.0	126.1	127.4	24	124.6	125.7	126.1	24	05/12
05/13	120.5	121.8	122.2	24	130.3	131.3	131.8	24	122.3	124.7	125.4	24	131.3	132.5	132.8	24	126.5	127.7	128.3	24	126.1	126.5	127.1	24	05/13
05/14	122.5	123.6	124.0	23	131.0	132.0	133.5	24	127.1	128.7	129.3	24	130.4	132.5	133.4	24	126.6	128.2	130.1	24	125.7	126.5	127.2	24	05/14
05/15	125.0	125.9	126.5	24	133.5	133.6	133.9	24	129.7	130.6	131.2	24	131.4	132.2	132.2	24	129.1	129.6	130.7	24	126.7	127.0	127.3	24	05/15
05/16	123.9	125.9	125.2	24	133.2	133.6	133.9	24	128.3	130.5	129.4	24	132.2	133.0	133.5	21	125.0	129.2	126.0	24	124.3	126.7	125.6	24	05/16
05/17	122.0	123.3	122.3	24	130.2	132.8	132.3	24	124.1	128.0	126.6	24	133.3	133.4	133.7	12	124.4	125.3	126.7	24	123.0	124.0	123.7	24	05/17
05/18	122.3	122.6	122.7	24	129.9	130.2	130.5	24	121.1	122.6	121.9	24	133.1	133.4	133.7	24	126.4	128.1	128.6	24	124.2	125.1	125.6	24	05/18
05/19	122.8	123.6	124.0	24	130.0	130.0	130.6	24	123.2	124.7	125.3	24	132.8	133.0	133.6	24	128.2	128.9	129.5	24	125.4	125.7	126.2	24	05/19
05/20	123.1	123.7	123.8	24	130.0	130.2	130.5	24	126.0	126.5	126.9	24	133.3	133.4	133.9	24	127.1	128.9	128.2	24	124.8	125.8	125.4	24	05/20
05/21	122.3	123.0	123.4	24	130.2	130.4	130.7	24	126.0	126.5	126.8	24	133.3	133.4	134.0	24	127.5	129.2	129.9	24	124.9	125.3	125.6	24	05/21
05/22	122.8	123.4	123.7	24	130.4	130.5	131.0	24	126.6	127.3	127.7	24	132.3	133.3	133.4	24	129.5	130.6	131.5	24	125.2	125.9	126.9	24	05/22
05/23	124.0	124.6	125.0	24	132.5	133.0	133.2	24	128.3	129.0	129.4	24	131.6	132.2	132.9	24	128.8	130.7	129.9	24	126.6	126.7	127.4	24	05/23
05/24	123.8	124.6	124.5	23	131.1	132.3	131.5	19	126.7	128.9	128.0	23	131.8	132.3	133.3	23	126.6	128.8	128.2	23	125.4	126.6	126.1	23	05/24

FISH PASSAGE CENTER

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

[INTERNAL PURPOSES ONLY]

Date 5/25/2018 7:15:10 AM

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Total Dissolved Gas Data at Mid-Columbia Sites

Date	Bonneville				Warrendale				CamasWashug.				Cascade Isld.				Date
	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	24 h Avg	12 h Avg	High	# Hr	
05/11	118.6	120.9	120.0	24	123.7	124.2	125.0	24	121.0	122.0	122.2	24	125.1	125.8	126.6	24	05/11
05/12	121.9	123.3	124.5	24	126.7	127.7	128.1	24	123.7	125.3	125.8	24	127.2	127.9	128.2	24	05/12
05/13	127.2	128.1	128.6	24	129.7	130.2	130.3	24	127.5	129.1	129.9	24	128.1	128.2	128.3	6	05/13
05/14	128.1	128.4	128.7	24	130.4	130.8	131.3	24	129.0	130.1	130.8	24				0	05/14
05/15	125.3	128.2	127.2	24	130.2	130.9	130.7	24	128.4	130.0	129.2	24				0	05/15
05/16	121.1	123.9	122.2	24	129.2	130.1	130.1	24	127.9	128.5	128.6	24				0	05/16
05/17	119.4	120.7	120.2	24	127.7	128.6	128.3	24	126.1	128.3	127.5	24				0	05/17
05/18	121.4	122.8	123.4	24	128.8	129.4	129.7	24	126.3	126.9	127.3	24				0	05/18
05/19	125.8	126.5	126.9	24	130.6	130.9	131.3	24	128.3	129.2	129.7	24				0	05/19
05/20	124.4	126.5	126.1	24	129.4	130.7	129.8	24	127.8	129.2	128.6	24				0	05/20
05/21	123.0	123.7	123.6	24	129.1	129.4	129.6	24	127.2	127.8	128.4	24				0	05/21
05/22	126.5	128.1	128.7	24	131.2	131.8	132.4	24	128.9	130.5	131.3	24				0	05/22
05/23	127.4	128.7	128.8	24	131.1	131.6	131.6	24	129.5	130.5	130.6	24				0	05/23
05/24	123.9	126.2	124.5	23	129.5	130.8	130.1	23	127.6	129.5	128.8	23				0	05/24

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

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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)
05/11/2018		30	361	96	230,995	47,044	46,464	1,841	138,469		63,914
05/12/2018		48	170		180,308	110,343	40,040	1,735		93,151	62,014
05/13/2018		22	65		52,053	135,605	60,253	1,702	120,627		37,526
05/14/2018		26	33		41,052	98,820	55,498	1,844		82,877	24,029
05/15/2018		26	48		32,851	60,644	37,902	1,683	111,541		59,120
05/16/2018		31	66		45,921	55,268	25,414	1,345		69,865	61,159
05/17/2018		15	106		68,328	41,247	21,219	729	83,294		18,159
05/18/2018		26	106		49,313	48,167	33,497	683		64,453	17,239
05/19/2018		10	48		39,884	32,881	36,450	393	26,274		7,297
05/20/2018		7	28		23,440	34,421	19,900	322		27,400	14,470
05/21/2018		11	30		14,445	22,581	10,793	224	39,225		18,701
05/22/2018			42		22,484	14,537	6,895	175		23,251	26,277
05/23/2018			20		7,912	14,642	7,775	113	24,279		15,477
05/24/2018			53		8,995	12,201	5,039	136		13,846	15,051
05/25/2018											
Total:	0	252	1,176	96	817,981	829,204	407,139	12,925	543,709	374,843	440,433
# Days:	0	11	14	1	14	14	14	14	7	7	14
Average:	0	23	84	96	58,427	59,229	29,081	923	77,673	53,549	31,460
YTD:	23,452	40,884	21,713	12,792	4,596,328	2,791,106	2,016,488	49,033	1,409,063	1,196,015	1,827,001

roseburghighschoolfounda-
tion@gmail.com

Number of hours sampled:

- No data available or no sample conducted

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

Smolt Monitoring Program Two Week Passage Index Report

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COMBINED SUBYEARLING CHINOOK

Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (Index)	LGS (Index)	LMN (Index)	RIS (Index)	MCN (Index)	JDA (Index)	BO2 (Index)
05/11/2018		0	0	11	2,698	0	0	192	17,934		16,198
05/12/2018		0	0		5,321	0	0	303		1,243	7,991
05/13/2018		0	4		2,588	0	0	374	16,440		2,525
05/14/2018		0	0		2,219	592	0	147		4,788	3,887
05/15/2018		0	21		1,916	1	0	151	143,861		5,375
05/16/2018		0	9		5,278	555	0	177		5,641	1,690
05/17/2018		0	2		7,534	294	157	381	58,473		2,594
05/18/2018		1	4		11,403	1,617	0	126		6,679	5,040
05/19/2018		0	1		6,506	163	0	260	31,275		4,090
05/20/2018		0	11		3,309	1,930	485	299		18,046	10,310
05/21/2018		0	3		6,112	4,519	483	190	21,600		5,233
05/22/2018			5		12,366	2,395	1,443	238		9,998	6,797
05/23/2018			6		15,279	4,558	6,172	293	15,916		6,825
05/24/2018			5		13,058	10,678	4,865	248		5,275	4,032
05/25/2018											
Total:	0	1	71	11	95,587	27,302	13,605	3,379	305,499	51,670	82,587
# Days:	0	11	14	1	14	14	14	14	7	7	14
Average:	0	0	5	11	6,828	1,950	972	241	43,643	7,381	5,899
YTD:	0	1	75	192	125,567	29,042	14,335	4,875	344,119	54,224	1,341,296

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

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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)
05/11/2018		0	92	5	16,790	13,251	430	1,881	25,454		8,758
05/12/2018		0	51		16,848	8,493	1,281	2,386		7,762	11,508
05/13/2018		0	41		4,889	16,395	2,488	2,569	25,010		11,644
05/14/2018		0	36		3,883	7,693	828	3,384		9,575	6,007
05/15/2018		0	37		2,190	10,090	648	3,847	14,121		12,031
05/16/2018		0	38		5,542	4,756	305	2,226		8,772	5,210
05/17/2018		0	54		6,755	5,003	472	1,637	17,344		5,188
05/18/2018		0	68		5,563	4,960	161	802		13,358	7,955
05/19/2018		0	21		7,072	5,913	999	1,476	6,881		4,021
05/20/2018		0	22		8,825	4,838	647	844		9,691	5,076
05/21/2018		0	12		5,834	7,094	644	899	9,057		5,492
05/22/2018			57		10,961	5,733	481	998		6,975	11,244
05/23/2018			17		9,004	4,726	882	911	6,094		7,882
05/24/2018			50		3,192	4,064	1,911	794		4,176	5,544
05/25/2018											
Total:	0	0	596	5	107,348	103,009	12,177	24,654	103,961	60,309	107,560
# Days:	0	11	14	1	14	14	14	14	7	7	14
Average:	0	0	43	5	7,668	7,358	870	1,761	14,852	8,616	7,683
YTD:	0	0	1,084	1,365	227,973	175,498	30,285	37,062	193,957	80,095	431,910

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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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)
05/11/2018		751	260	36	122,941	90,516	38,720	880	5,872		4,817
05/12/2018		455	66		164,643	53,678	32,672	774		36,641	7,672
05/13/2018		452	25		72,184	64,296	44,222	599	7,744		7,400
05/14/2018		511	14		48,816	72,760	31,476	490		17,054	3,887
05/15/2018		541	10		37,505	38,288	20,409	466	6,284		9,471
05/16/2018		634	21		40,906	30,513	17,477	568		24,124	6,149
05/17/2018		504	54		34,294	17,908	13,046	324	4,465		5,046
05/18/2018		703	58		49,009	15,570	15,138	137		15,027	6,098
05/19/2018		358	23		47,805	20,126	15,479	228	3,753		1,980
05/20/2018		274	34		55,981	32,048	14,237	172		12,030	2,906
05/21/2018		183	19		51,948	25,143	13,048	184	2,085		3,138
05/22/2018			30		31,759	28,583	7,376	119		9,533	5,491
05/23/2018			22		30,285	18,854	14,108	119	3,306		2,807
05/24/2018			75		29,597	17,230	7,992	127		5,824	2,520
05/25/2018											
Total:	0	5,366	711	36	817,673	525,513	285,400	5,187	33,509	120,233	69,382
# Days:	0	11	14	1	14	14	14	14	7	7	14
Average:	0	488	51	36	58,405	37,537	20,386	371	4,787	17,176	4,956
YTD:	723	26,256	3,848	5,328	3,730,963	2,844,630	1,876,664	18,862	224,642	611,534	325,472

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

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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)
05/11/2018		0	0	52	1,199	23	430	3,998	356,362		58,662
05/12/2018		0	0		7,094	727	320	3,527		55,890	58,817
05/13/2018		0	0		16,392	1,270	276	2,754	199,727		51,976
05/14/2018		0	0		19,694	2,965	552	4,060		38,597	45,231
05/15/2018		0	0		21,080	4,257	972	1,297	148,274		87,271
05/16/2018		0	0		45,129	4,466	611	851		35,089	53,461
05/17/2018		0	0		55,078	2,425	2,672	705	61,650		22,915
05/18/2018		0	1		15,575	7,192	7,569	596		40,075	41,101
05/19/2018		0	2		14,143	11,837	6,325	442	23,144		12,610
05/20/2018		0	0		15,995	18,368	5,501	695		13,700	11,863
05/21/2018		0	0		10,556	8,406	3,222	313	19,776		9,545
05/22/2018			0		8,431	10,865	2,726	1,075		10,928	15,362
05/23/2018			0		4,365	5,236	3,687	727	24,833		9,228
05/24/2018			0		871	10,182	2,432	390		8,132	11,714
05/25/2018											
Total:	0	0	3	52	235,602	88,219	37,295	21,430	833,766	202,411	489,756
# Days:	0	0	0	52	16,829	6,301	2664	1,531	119,109	28916	34,983
Average:	0	0	0	52	16,829	6,301	2,664	1,531	119,109	28,916	34,983
YTD:	0	0	3	115	255,265	105,527	45,111	75,272	1,426,055	342,894	686,578

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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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)
05/11/2018		0	0	0	26	1,600	0	26	5,600		143
05/12/2018		0	0		48	4,800	600	41		2,143	100
05/13/2018		0	0		13	4,000	1,400	14	6,600		210
05/14/2018		0	0		11	2,000	1,400	6		5,714	100
05/15/2018		0	0		24	1,600	2,800	4	36,600		67
05/16/2018		0	0		15	1,000	11,000	2		16,143	120
05/17/2018		0	0		3	400	12,800	0	25,650		100
05/18/2018		0	0		1	800	7,100	0		76,000	867
05/19/2018		0	0		6	400	700	4	40,400		900
05/20/2018		0	0		4	400	0	1		11,000	1,745
05/21/2018		0	0		5	0	0	2	19,660		2,533
05/22/2018			0		5	100	400	1		6,400	1,950
05/23/2018			0		1	200	200	1	3,300		805
05/24/2018			0		0	600	600	1		2,700	233
05/25/2018											
Total:	0	0	0	0	162	17,900	39,000	103	137,810	120,100	9,873
# Days:	0	11	14	1	23	19	15	19	7	7	16
Average:	0	0	0	0	7	942	2,600	5	19,687	17,157	617
YTD:		1	3		212	29,334	42,200	319	149,212	158,643	16,444

- No data available or no sample conducted

* - Juvenile lamprey can escape the sample tank at LGR which would lead to unreliable estimates of collection. Therefore, only sample counts are provided in this report.

Number of hours sampled:

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

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Smolt Monitoring Program Sites and Agency Collaborations:

- WTB (Collection) - Salmon River Trap at Whitebird : Collection Counts
- IMN (Collection) - Imnaha River Trap : Collection Counts
- GRN (Collection) - Grande Ronde River Trap : Collection Counts
- LEW (Collection) = Snake River Trap at Lewiston : Collection Counts
- LGR (Index) - Lower Granite Dam Bypass Collection System : Passage Index Counts
- LGS (Index) - Little Goose Bypass Collection System : Passage Index Counts
- LMN (Index) - Lower Monumental Dam Bypass Collection System : Passage Index Counts
- RIS (Index) - Rock Island Dam Second Powerhouse Bypass Trap : Passage Index Counts
- MCN (Index) - McNary Dam Bypass Collection System : Passage Index Counts
- JDA (Index) - John Day Dam Bypass Collection System : Passage Index Counts
- BO2 (Index) - Bonneville Dam Second Powerhouse Bypass Collection System : Passage Index Counts

- No data available or no sample conducted

Number of hours sampled:

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 Passage Index = Collection Counts / (Powerhouse Flow / (Powerhouse Flow + Spill))
 RIS, BO2 (Index) = Rock Island Dam Second Powerhouse Bypass Trap : Passage Index Counts Passage Index = Collection Counts / (Powerhouse 2 Flow / (Powerhouse 1 & 2 Flow + Spill))
- Combined lamprey juvenile collection counts are provided for all sites. Combined lamprey juveniles is a combination of pacific lamprey ammocoetes, brook lamprey ammocoetes, unknown lamprey ammocoetes, pacific lamprey macrophthalmia, and unidentified lamprey species.
- Most samples occur over a 24-hr period that spans two calendar days. In this report, the date shown corresponds with the sample end date.

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YTD Transportation Summary Report

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Lower Granite Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	86800	3013283	160300	185121	2397596	8240696
Sum of Number Barged	75043	2401966	156721	180499	1691525	6197279
Sum of Number Bypassed	11666	610234	3539	4464	705872	2041647
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	12	58	0	7	42	161
Sum of Facility Morts	79	1020	40	151	150	1590
Sum of Reseach Morts	0	5	0	0	7	19
Sum of Total Project Mort	91	1083	40	158	199	1770

Little Goose Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	17839	1829933	113734	65898	1876877	5781158
Sum of Number Barged	16983	1519175	113065	57534	1264897	4236551
Sum of Number Bypassed	808	306206	407	7716	611659	1538455
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	4	40	3	10	12	81
Sum of Facility Morts	44	4512	259	638	309	6071
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	48	4552	262	648	321	6152

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YTD Transportation Summary Report

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Lower Monumental Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	8650	1201283	17650	27800	1140267	3535917
Sum of Number Barged	8634	1001445	17548	26158	887986	2829757
Sum of Number Bypassed	0	199433	100	1598	252167	705465
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	1	7	0	3	6	23
Sum of Facility Morts	15	398	2	41	108	672
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	16	405	2	44	114	695

Total

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	113289	6044499	291684	278819	5414740	17557771
Sum of Number Barged	100660	4922586	287334	264191	3844408	13263587
Sum of Number Bypassed	12474	1115873	4046	13778	1569698	4285567
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	17	105	3	20	60	265
Sum of Facility Morts	138	5930	301	830	567	8333
Sum of Reseach Morts	0	5	0	0	7	19
Sum of Total Project Mort	155	6040	304	850	634	8617

Cumulative Adult Passage at Mainstem Dams Through: 05/24

dam	enddate	Spring Chinook						Summer Chinook						Fall Chinook					
		2018		2017		10-Yr Avg.		2018		2017		10-Yr Avg.		2018		2017		10-Yr Avg.	
		Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack
BON	05/24	77602	5811	66458	13127	140499	22655	0	0	0	0	0	0	0	0	0	0	0	0
TDA	05/24	41793	3702	37241	6633	105021	17856	0	0	0	0	0	0	0	0	0	0	0	0
JDA	05/23	31418	3230	21359	3475	87714	15328	0	0	0	0	0	0	0	0	0	0	0	0
MCN	05/24	23975	1589	14767	1480	76192	11300	0	0	0	0	0	0	0	0	0	0	0	0
IHR	05/24	16944	975	9355	975	53941	7017	0	0	0	0	0	0	0	0	0	0	0	0
LMN	05/23	14330	911	7140	673	49987	5356	0	0	0	0	0	0	0	0	0	0	0	0
LGS	05/24	10900	711	5546	602	44315	5616	0	0	0	0	0	0	0	0	0	0	0	0
LGR	05/24	9769	623	4477	405	41021	5263	0	0	0	0	0	0	0	0	0	0	0	0
PRD	05/23	2160	202	1356	29	11819	724	0	0	0	0	0	0	0	0	0	0	0	0
WAN	05/23	2168	136	1067	18	11337	705	0	0	0	0	0	0	0	0	0	0	0	0
RIS	05/23	1485	72	837	5	10173	683	0	0	0	0	0	0	0	0	0	0	0	0
RRH	05/23	669	33	411	0	3800	254	0	0	0	0	0	0	0	0	0	0	0	0
WEL	05/23	147	5	134	1	2511	216	0	0	0	0	0	0	0	0	0	0	0	0
WFA	05/22	11750	919	8440	380	18626	563	0	0	0	0	0	0	0	0	0	0	0	0

DAM	ENDDATE	Coho						Sockeye			Steelhead						Lamprey		
		2018		2017		10-Yr Avg.		2018	2017	10-Yr Avg.	10-Yr Unclipped		Unclipped		10-Yr Avg.	2018	2017	10-Yr Avg.	
		Adult	Jack	Adult	Jack	Adult	Jack				2018	2017	2018	2017					2018
BON	05/24	1	-1	0	0	0	0	1	2	1	3413	3015	4788	1356	992	1513	1221	1065	627
TDA	05/24	4	0	0	0	0	0	0	0	0	173	1468	2114	61	503	917	0	0	0
JDA	05/23	0	0	0	0	0	1	0	1	0	370	522	3994	176	335	1777	77	89	54
MCN	05/24	-4	0	0	0	1	0	1	0	0	364	2528	4142	169	755	1665	17	0	2
IHR	05/24	-1	0	0	0	0	0	0	0	0	1288	1060	4174	434	498	1501	5	-2	0
LMN	05/23	0	0	0	0	0	0	0	0	0	1195	1420	8121	311	683	2789	2	0	0
LGS	05/24	0	0	0	0	0	0	0	0	0	1219	1479	4968	317	653	2531	1	0	0
LGR	05/24	0	0	0	0	0	0	0	0	0	4527	7290	8690	1257	3037	3648	0	0	0
PRD	05/23	0	0	0	0	0	0	0	0	0	30	27	47	0	0	0	94	13	5
WAN	05/23	0	0	0	0	0	0	0	0	0	52	27	97	0	0	0	39	1	1
RIS	05/23	0	0	0	0	0	0	0	0	0	57	53	104	20	16	55	0	0	0
RRH	05/23	0	0	0	0	0	0	0	0	0	83	116	302	28	25	204	0	0	0
WEL	05/23	0	0	0	0	0	0	0	0	0	111	31	64	37	20	44	3	0	0
WFA	05/22	0	2	117	117	0	0	0	0	0	3723	1016	10031	1580	661	0	0	0	0

PRD does not post wild steelhead numbers.
 These numbers were collected from USACE, Grant PUD, Douglas PUD, Chelan PUD, ODFW and DART.
 Wild steelhead numbers are included in the total. Wild Steelhead are defined as unclipped fish.
 Historic counts (pre-1996) were obtained from CRITFC and compiled by the FPC.
 Historic counts 1997 to present were obtained from the Corps of Engineers.

