



# Fish Passage Center

## Weekly Report #19-04

March 29, 2019

### This Week's Highlights

#### Water Supply

Precipitation throughout the Columbia Basin has varied between 19% and 47% of average at individual sub-basins over March. Precipitation above The Dalles has been 33% of average over March. Over the 2019 water year, precipitation has ranged between 68% and 92% of average.

**Table 1. Summary of March 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		Water Year 2019	
	March 1-28, 2019		October 1, 2018 to March 28, 2019	
	Observed (inches)	% Average	Observed (inches)	% Average
Columbia Above Coulee	0.76	24	16.7	74
Snake River Above Ice Harbor	0.92	44	12.3	90
Columbia Above The Dalles	0.80	33	13.6	81
Kootenai	0.57	19	15.0	68
Clark Fork	0.83	36	13.3	89
Flathead	0.61	21	14.6	72
Pend Oreille River Basin above Waneta Dam	0.75	27	14.5	77
Salmon River Basin	1.29	47	15.6	92
Upper Snake Tributaries	0.95	39	13.0	85
Clearwater	1.14	30	20.4	80
Willamette River above Portland	2.06	31	37.1	76

Snowpack within the Columbia Basin has been variable. Average snowpack in the Columbia River for basins above the Snake River confluence is 88% of average, for Snake River Basins the average snowpack is 121% of average, and for lower Columbia Basins between McNary and Bonneville Dam average snowpack is 133% of average.

Table 2 displays the March 28<sup>th</sup> ESP runoff volume forecasts for multiple reservoirs along with the March COE forecasts at Libby and Dworshak. The March 28<sup>th</sup> ESP forecast at The Dalles between April and August is 72,671 Kaf (83% of average).

**Table 2. March 28 ESP Runoff Volume Forecasts for various reservoirs within the Columbia and Snake River Basins.**

Location	March 28, 2019 5-day QPF ESP	
	% Average (1981-2010)	Runoff Volume (Kaf)
The Dalles (Apr-Aug)	83	72,671
Grand Coulee (Apr-Aug)	82	46,742
Libby Res. Inflow, MT (Apr-Aug)	73 93**	4,292 5478**
Hungry Horse Res. Inflow, MT (Apr-Aug)	83	1,604
Lower Granite Res. Inflow (Apr- July)	90	17,901
Brownlee Res. Inflow (Apr-July)	94	5,135
Dworshak Res. Inflow (Apr-July)	84 88**	2,025 2,142**

\*\*COE March Final Forecast

Grand Coulee Reservoir is at 1259.0 feet (3-28-19) and has refilled 0.7 feet over the last week. Outflows at Grand Coulee have ranged between 42.0 Kcfs and 68.2

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 (3-28-19) 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 3520.7 feet (3-28-19) and has held steady over the last week. Outflows at Hungry Horse have been 1.5- 3.1 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 1529.9 feet (3-28-19) and has refilled 4.2 feet over last week. Dworshak outflows have been 1.7-3.7 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 2037.0 feet on March 28, 2019 and has refilled 5.0 feet in the last week. Outflows at Hells Canyon have ranged between 16.6 and 28.3 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 River have increased this week, when compared to the previous week. Daily average flows at Lower Granite Dam ranged from 61.7 to 82.3 Kcfs. Daily average flows in the Upper Columbia decreased this week, when compared to the previous week. Daily average flow at Rock Island Dam ranged from 50.1 to 71.2 Kcfs this week. Finally, daily average flows in the Mid-Columbia increased this week, with daily average flows at McNary Dam in the 137.6 to 161.5 Kcfs range.

Involuntary spill (i.e., spill outside of fish passage season) has been provided at two FCRPS projects this week, Ice Harbor and The Dalles. The involuntary spill at Ice Harbor has occurred since March 19<sup>th</sup> and is likely due to decreased hydraulic capacity, as two units are currently out of service. With the increases in flows in the Snake River, spill volumes at Ice Harbor

Dam were as high as 40 Kcfs for some hours this week. From March 15<sup>th</sup> to March 21<sup>st</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 March 21<sup>st</sup>. Involuntary spill of approximately 20 Kcfs was also provided at The Dalles Dam from 1800 on March 25<sup>th</sup> through 1800 on March 26<sup>th</sup>. Voluntary spill for fish passage at FCRPS projects is expected to begin on April 3<sup>rd</sup> in the Snake River and April 10<sup>th</sup> in the Mid-Columbia.

### Smolt Monitoring

The Smolt Monitoring Program (SMP) is currently collecting data from four bypass facilities: Bonneville Dam, John Day Dam, Lower Granite 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 Little Goose, McNary, and Rock Island dams are expected to begin next week.

Subyearling Chinook continued to dominate the samples at Bonneville Dam (BON) this week. Nearly all (99.9%) of the subyearling Chinook sampled at BON this week were fry. The daily average passage index for subyearling Chinook fry this week was nearly 1,800 per day, which is a large increase over last week's daily average passage index of about 300 per day. A small number of yearling Chinook, coho, and steelhead were also collected this week. Approximately 90% of the coho that were collected this week were fry. Pacific lamprey macrophthalmia were encountered in all seven samples this week. This week's daily average collection for Pacific lamprey macrophthalmia was about 220 per day, which is an increase over last week's daily average collection of only 60 per day. Pacific lamprey ammocoetes were encountered in one of this week's samples (March 26<sup>th</sup>).

Similar to the last few years, sampling at John Day Dam (JDA) is every-other-day. Yearling Chinook dominated the salmonid samples at JDA this week. This week's daily average passage index for yearling Chinook was about 130 per day, which is similar to last week's daily average passage index. Of the yearling Chinook collected this week, approximately 16% were yearling fall Chinook holdovers. The only other

salmonids that were encountered in this week's samples were coho and steelhead, which were encountered in low numbers. Finally, Pacific lamprey macrophthalmia were encountered in all four of this week's samples, with a daily average collection of nearly 9,000 per day. This high daily average collection is largely due to a single day (March 24<sup>th</sup>), where the estimated collection for Pacific lamprey macrophthalmia at JDA was 29,400. Pacific lamprey ammocoetes were encountered in three of this week's four samples. This week's daily average collection for Pacific lamprey ammocoetes was nearly 600 per day.

Sampling at Lower Granite Dam (LGR) began on March 25<sup>th</sup>, with the first sample tallied and reported to the FPC on March 26<sup>th</sup>. Yearling Chinook and steelhead have dominated the first three samples from LGR. This week's daily average passage indices for these two species were 2,500 and nearly 3,800 per day, respectively. Of the yearling Chinook sampled this week, approximately 25% were yearling fall Chinook holdovers. Of the steelhead sampled this week, approximately 91% were of hatchery origin. Subyearling Chinook, sockeye, and coho were also encountered in this week's samples at LGR, but in relatively low numbers. All of the subyearling Chinook sampled at LGR this week were fry. Finally, both Pacific lamprey macrophthalmia and ammocoetes were encountered in all three of this week's samples at LGR. Daily average sample counts were 42 per day for macrophthalmia and 10 per day for ammocoetes.

Sampling at Lower Monumental Dam (LMN) will 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 24,400, which is a large increase from last week's daily average passage index of about 3,000 per day. This large increase is largely due to an emergency release of approximately 150,000 yearling fall Chinook from Lyons Ferry Hatchery on March 11<sup>th</sup>. Lyons Ferry Hatchery is located approximately 30 kilometers above LMN. Approximately 98% of the yearling Chinook encountered in this week's samples at LMN were yearling fall Chinook from Lyons Ferry Hatchery. Steelhead passage decreased this week, when compared to the previous week. This week's daily average passage index for steelhead at LMN was about 600

per day, whereas that for last week was nearly 1,200 per day. No other salmonids were encountered in this week's samples at LMN. Finally, no lamprey juveniles were encountered in this week's samples at LMN.

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 (17 total), yearling Chinook (30 total), coho (9 total), and steelhead (60 total). Of the yearling Chinook collected this week, zero were yearling fall Chinook holdovers and approximately 70% were of hatchery origin. Of the steelhead collected this week, approximately 95% were of hatchery origin.

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. Due to high flows, no sampling occurred on March 26<sup>th</sup>. The trap was moved to a different position in the river and sampling was resumed for March 27<sup>th</sup> and March 28<sup>th</sup>. This week's samples of salmonids at GRN consisted of yearling Chinook (5 total) and steelhead (3 total). In addition, 26 total Pacific lamprey ammocoetes and 40 total Pacific lamprey macrophthalmia were encountered in this week's samples. This is the first time that Pacific lamprey macrophthalmia have been collected at GRN since juvenile lamprey became a target species in 2011.

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 nearly 1,000 per day, which is an increase from last week's daily average collection of about 500 per day. The majority (92%) of the yearling Chinook in this week's samples were clipped 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 on March 25<sup>th</sup>.

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 March 25<sup>th</sup>. Salmonid collections over the last week of available data (March 19-25) consisted of yearling Chinook (791 total) and steelhead (63 total). Of the yearling Chinook that were collected over this last week, approximately 33% were of known hatchery origin. All of the steelhead collected over this last week were unclipped. Finally, both Pacific lamprey ammocoetes (19 total) and Pacific lamprey macrophthalmia (1 total) were collected at IMN over this last week. The ammocoetes and macrophthalmia were all encountered in the sample from March 24<sup>th</sup>.

### Hatchery Releases

FPC has not received preliminary data from some hatcheries as of 3/29/19, 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. Almost 5 million spring and summer Chinook were scheduled to be released into this zone over the last week. Of these 77% were released into the Clearwater River or one of its tributaries. The rest were scheduled to be released into tributaries of the Salmon River; 1 million into the Salmon, and another 127,000 summer Chinook into Johnson Creek.

In the next two weeks, approximately 1.37 million spring Chinook will be released into this zone. Of these, approximately 50% will be released into the Middle Fork of the Clearwater River at Kooskia hatchery. There are also releases scheduled for the Grande Ronde River (250,000), Imnaha River (280,000), and Tucannon River (150,000). Additionally, there are another 280,000 summer Chinook planned for release into the South Fork Salmon River starting on March 29<sup>th</sup> and running through May 2<sup>nd</sup>. Finally, there are two releases of fall Chinook in this zone over the next two weeks, the first on April 1<sup>st</sup> of 449,000 at Lyons Ferry, and the second on April 2<sup>nd</sup> of 160,000 at Captain Johns Landing.

Approximately 7.58 million summer steelhead are also planned for release into this zone over the next two weeks, 46% of which are planned for release

into the Salmon River and its tributaries; at Sawtooth Hatchery, Pahsimeroi River, and the South and Yankee Forks of the Salmon. The Clearwater River and its tributaries account for a majority of the remaining releases at Clear Creek (422,000), Newsome Creek (124,000), Lolo Creek (247,000), Dworshak Hatchery (1.33 million) and the South Fork Clearwater (1.05 million). Finally, the remaining scheduled releases are planned for the Imnaha (Little Sheep Creek: 215,000), Grande Ronde (227,000), Wallowa (320,000), and Tucannon Rivers (104,000).

### 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 was on release of 310 coho smolts into the Wenatchee River. Over the next two weeks approximately 480,000 spring Chinook are scheduled for release in this zone. 86% of these will be to the Wenatchee River, with the remainder released into the Chewuch, a tributary of the Methow River. There are also 1.25 million summer Chinook planned for release over the next two weeks. These are split between the Similkameen River (240,000), Chelan Falls (530,000), and the Wenatchee (486,000) all on April 1<sup>st</sup>. Additionally, there are three scheduled releases of summer steelhead scheduled for April 1<sup>st</sup> as well, 68,000 in the Okanogan, and two releases into the Wenatchee totaling 267,000 fish.

### 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). Five spring Chinook releases were planned for the past week within this zone, a majority of which were released into the Walla Walla and Klickitat Rivers (250,000 and 634,000 respectively), and another 25,000 were released within the Deschutes River basin in the Metolius, Crooked River, and Wycus Creek. Additionally, there was one release of 500,000 coho scheduled in the Umatilla River over the last week.

Over the next two weeks approximately 3.96 million spring and summer Chinook are scheduled to be released into this zone. Of these, 32% are scheduled for release into the Umatilla River at Imeques and Thornhollow acclimation ponds. Another 1.2 million are scheduled for release into the Wind River on April

10<sup>th</sup>, with the remainder split between the Deschutes (380,000), Hood (75,000), and Little White Salmon (1.04 million) Rivers. Additionally, 7 million fall Chinook are planned for release on April 8<sup>th</sup> from Spring Creek Hatchery.

Other scheduled releases include approximately 3 million juvenile coho that are planned for release into the Klickitat River (2.5 million) on April 1<sup>st</sup>, and Umatilla River (506,000) on April 10<sup>th</sup>. Finally, there are a number of summer steelhead releases in this zone over the next two weeks into the Touchet (142,000), Deschutes (163,000), Klickitat (90,000), and Ringold Spring Hatchery (180,000).

### **Lower Columbia Zone:**

The Lower Columbia Zone is defined as the Columbia River and its tributaries below Bonneville Dam. Over the past week there was only a single release of spring Chinook scheduled for this zone, where 250,000 were planned at Tongue Point on the Lower Columbia. Another 290,000 Chum were scheduled for release at Big Creek Hatchery, and 90,000 summer steelhead were scheduled for release into the Santiam River.

Over the next two weeks there are approximately 1.2 million spring Chinook juveniles that are planned for release within this zone. Of these, just over 154,000 are planned to be released into the Cowlitz River, another 66,000 into the Sandy River at the Bull Run acclimation pond, 234,000 into the middle fork of the Willamette, and the remaining 750,000 planned for release into the Columbia River at Tongue Point, the Deep River net pens, and at Youngs Bay. Further, approximately 7.2 million coho are also planned for release into this zone; 2 million into the Lewis River, 2.35 million into the Cowlitz River, 770,000 in the south fork of the Klaskanine River, 200,000 into the Sandy, 306,000 into the Kalama, 350,000 at Eagle Creek, and the remaining 1.2 million into the Columbia River below Bonneville Dam.

Approximately 1.48 million summer steelhead are scheduled to be released into the Lower Columbia zone in the next two weeks. Of these, roughly 39% will be released into the Willamette and its tributaries the Clackamas and Santiam Rivers. The remaining releases are scheduled for the Elochoman River (30,000), Lewis River (59,000), Cowlitz River (640,000), Toutle River (20,000), Washougal River (70,000), and Kalama River (91,800).

Finally, another 1.35 million winter steelhead are also scheduled to be released in this zone over the next two weeks. Of these approximately 24% are heading out via the Sandy River, and another 13% via the Clackamas River. The remainder are split between the Cowlitz River (161,000), Elochoman River (126,000), Grays River (5,000), Kalama River (97,900), Klaskanine River (40,000), Sandy (320,000), Washougal River (105,000), with the remaining 140,000 released into the Columbia River below Bonneville Dam.

### **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 3/27/2019), 18 adult Chinook and 1,046 adult steelhead were counted. In 2018 for the same time frame, 16 adult Chinook and 1,448 adult steelhead were counted. The 2019 Bonneville Dam winter season count of adult steelhead had 402 fewer fish than the 2018 count.

The Willamette Falls cumulative steelhead count from January 1<sup>st</sup> through March 27<sup>th</sup> is 2,202. The 2019 Willamette Falls winter steelhead count has 1,280 more fish than the 2018 count of 922 while being about 72.3% of the 10-year average count of 3,046. This year's Lower Granite steelhead count of 1,239 has 321 fewer fish than the 2018 count of 1,560 and is about 30.4% of the 10-year average count of 4,080.

## Hatchery Releases Last Two Weeks

### Hatchery Release Summary

From: 3/16/2019 to 03/29/19

Agency	Hatchery	Species	Race	MiqYr	NumRel	RelStart	RelEnd	RelSite	RelRiver	Zone
Idaho Dept. of Fish and Game	Clearwater Hatchery	CH1	SP	2019	402,627	03-21-19	03-22-19	Selway River	Clearwater River M F	SNAK
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	McCall Hatchery	CH1	SU	2019	127,763	03-29-19	04-01-19	Johnson Cr Idaho River	South Fork Salmon River	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	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>4,672,046</b>					
Nez Perce Tribe	Dworshak NFH	CH1	SP	2019	247,263	03-27-19	03-27-19	Kooskia Hatchery	Clearwater River M F	SNAK
<b>Nez Perce Tribe Total</b>					<b>247,263</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	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	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	Willamette Hatchery	CH1	SP	2019	234,000	03-22-19	03-22-19	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>889,000</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
<b>U.S. Fish and Wildlife Service Total</b>					<b>1,724,382</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
<b>Umatilla Tribe Total</b>					<b>750,000</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>8,917,001</b>					

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

## Hatchery Releases Next Two Weeks

### Hatchery Release Summary

From: 3/30/2019 to 4/12/2019

Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver	Zone
Colville Tribe	Wells Hatchery	ST	SU	2019	68,300	04-01-19	04-01-19	Okanogan River	Okanogan River	UCOL
<b>Colville Tribe Total</b>					68,300					
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	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	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	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	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	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	802,000	04-01-19	04-15-19	Pahsimeroi River	Pahsimeroi River	SNAK
<b>Idaho Dept. of Fish and Game Total</b>					5,299,492					
Nez Perce Tribe	Lyons Ferry Hatchery	CH1	FA	2019	160,000	04-02-19	04-02-19	Cpt John Acclim Pond	Snake River	SNAK
<b>Nez Perce Tribe Total</b>					160,000					
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	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	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	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	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	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	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	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	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	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	WI	2019	160,000	04-12-19	04-12-19	Cedar Creek (Sandy R)	Sandy 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	CH1	SP	2019	234,000	04-12-19	04-12-19	M Fk Willamette 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
<b>Oregon Dept. of Fish and Wildlife Total</b>					5,805,693					
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	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
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	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
<b>U.S. Fish and Wildlife Service Total</b>					11,990,004					
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	04-02-19	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>					1,777,000					

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>					
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		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>					
<b>Grand Total</b>					<b>37,658,614</b>					

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



### 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
03/15/2019	76.3	0.0	74.9	0.0	77.4	1.5	75.0	0.0	77.0	0.0	79.6	1.2	70.2	2.8
03/16/2019	83.0	0.0	80.6	0.0	81.4	0.5	81.8	0.0	86.5	0.0	70.6	0.0	72.9	0.0
03/17/2019	61.4	0.0	65.6	0.0	68.8	0.0	65.0	0.0	69.2	0.0	70.3	0.0	70.5	0.0
03/18/2019	75.1	0.0	70.0	0.0	75.1	0.0	76.3	0.0	80.7	0.0	83.8	0.0	79.3	0.0
03/19/2019	75.4	0.0	78.5	0.0	80.3	0.0	73.2	0.0	77.9	0.0	74.2	0.0	75.6	0.0
03/20/2019	61.0	0.0	59.9	0.0	64.1	0.0	61.4	0.0	64.1	0.0	72.3	0.0	76.1	0.0
03/21/2019	61.7	0.0	63.7	0.0	58.7	0.0	57.4	0.0	59.5	0.0	65.4	0.0	70.7	0.0
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	58.2	0.0	59.4	0.0	58.4	0.0	55.6	4.1	58.1	0.0	67.0	1.0	69.8	0.0

- Data not available or incorrect

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

### 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
03/15/2019	1.7	0.0			40.0	0.0	41.3	0.0	43.0	0.0	40.6	0.0		
03/16/2019	1.7	0.0			37.5	0.0	34.3	0.0	33.6	0.0	32.4	0.0		
03/17/2019	1.7	0.0			43.2	0.0	41.3	0.0	45.0	0.0	46.5	0.0		
03/18/2019	1.7	0.0			42.8	0.0	40.8	0.0	39.0	0.0	42.2	0.0		
03/19/2019	1.7	0.0			46.1	0.0	41.9	0.0	43.7	0.0	48.1	7.5		
03/20/2019	1.7	0.0			46.9	0.0	43.6	0.0	42.3	0.0	49.3	14.5		
03/21/2019	1.7	0.0			52.0	0.0	50.9	0.0	48.7	0.0	43.4	7.8		
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		

- Data not available or incorrect

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## 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		
03/15/2019	125.5	0.0	125.4	0.0	128.3	7.4	130.0	1.2	7.9	113.6
03/16/2019	99.9	0.0	108.6	0.0	108.2	7.7	130.6	1.3	8.0	113.8
03/17/2019	122.9	0.0	133.0	0.0	131.7	7.5	130.7	1.2	8.4	111.2
03/18/2019	117.1	0.0	127.7	0.0	122.8	7.5	129.7	1.0	17.0	101.8
03/19/2019	118.9	0.0	117.2	0.0	120.4	7.5	130.3	1.2	26.6	92.6
03/20/2019	123.7	0.0	124.6	0.0	126.5	11.2	131.1	1.2	26.1	94.3
03/21/2019	119.5	0.0	115.6	0.0	114.6	7.2	139.5	1.3	38.4	91.2
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	161.5	0.0	183.4	0.0	181.3	0.0	187.3	1.2	82.8	93.3

- Data not available or incorrect

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

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 Upper Columbia Sites**

Hungry H. Dnst				Boundary				Grand Coulee				Grand C. Tlwr				Chief Joseph				Chief J. Dnst				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
03/15									98.2	98.5	98.6	24	98.6	99.0	99.5	24	98.7	98.7	99.1	12	99.0	99.3	99.8	24	03/15
03/16									98.5	98.8	98.9	24	98.6	99.1	99.6	24	98.8	98.8	99.0	10	99.6	100.2	101.1	24	03/16
03/17									98.5	98.7	98.8	24	99.5	99.8	100.5	24	100.4	100.4	100.5	6	100.0	100.3	101.0	24	03/17
03/18									98.8	99.1	99.3	24	99.1	99.5	99.9	24	100.3	100.3	101.8	10	100.1	100.7	101.7	24	03/18
03/19									99.3	99.7	99.9	24	99.5	99.8	100.1	24	100.4	100.4	101.5	10	100.3	100.7	101.1	24	03/19
03/20									99.9	100.3	100.4	24	100.1	100.6	101.0	24	101.9	102.0	102.3	8	101.1	101.7	102.9	24	03/20
03/21									100.4	100.8	101.0	24	100.8	101.2	101.6	24	103.2	103.2	104.1	9	102.2	102.6	103.0	24	03/21
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	102.7	102.7	103.0	10	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	102.9	103.2	103.7	17	103.0	103.4	103.9	24	03/27
03/28									101.5	101.6	101.8	21	101.8	102.2	103.1	21				0	103.1	103.3	103.4	20	03/28

**Total Dissolved Gas Data at Upper Columbia Sites**

Wells				Wells Dwnstrm				Rocky Reach				Rocky R. Tlwr				Rock Island				Rock I. 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
03/15	98.1	98.5	98.7	24	99.2	100.0	101.9	24	98.9	99.3	99.5	24	100.1	100.4	100.8	23	98.8	99.0	99.7	22	99.1	99.4	100.5	19	03/15
03/16	98.9	99.4	99.6	24	99.4	100.1	100.8	24	99.4	99.5	99.7	24	100.4	100.8	101.1	24	99.3	99.5	99.6	24	99.4	99.6	99.6	23	03/16
03/17	99.4	99.6	99.9	24	99.8	100.2	100.9	24	100.0	100.5	100.9	23	100.6	101.0	102.3	19	99.4	99.6	99.9	21	99.5	99.7	100.0	18	03/17
03/18	100.1	100.7	100.9	24	100.5	101.1	101.6	24	100.9	101.1	101.5	22	101.4	101.7	102.4	20	100.5	101.1	101.5	22	100.6	101.1	101.6	20	03/18
03/19	100.9	101.3	101.6	24	101.3	101.8	102.4	24	101.6	101.9	102.3	23	102.3	102.6	103.1	21	100.9	101.7	102.1	23	101.4	101.6	101.9	20	03/19
03/20	101.6	102.0	102.2	24	102.0	102.6	103.1	24	102.4	102.7	103.0	23	102.8	103.1	103.5	22	102.1	102.4	102.8	23	102.3	102.5	102.7	23	03/20
03/21	102.3	102.8	103.7	24	102.6	103.4	105.0	24	103.2	103.6	103.9	23	103.5	103.7	103.9	23	102.6	102.9	103.2	23	102.7	103.1	103.4	23	03/21
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	102.8	102.9	103.2	19	103.0	103.2	103.5	19	104.1	104.3	104.5	21	105.7	106.2	115.5	15	103.5	103.8	104.1	17	103.6	103.9	104.1	14	03/28

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

**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
03/15	98.9	99.1	99.2	24				0	100.3	100.6	100.7	24	101.6	102.9	106.3	24					03/15
03/16	99.3	99.5	99.6	24				0	100.0	100.2	100.3	24	100.2	100.8	101.1	24					03/16
03/17	99.6	99.8	100.1	24				0	100.1	100.2	100.3	24	100.2	100.6	100.8	24					03/17
03/18	100.7	101.3	101.5	24				0	100.4	100.7	100.8	24	100.7	101.3	101.6	24					03/18
03/19	101.2	101.5	101.7	24	102.5	102.6	103.5	15	101.0	101.3	101.5	24	101.7	102.5	102.9	24					03/19
03/20	102.4	102.9	103.2	24	103.1	103.5	103.8	24	101.9	102.4	102.8	24	102.8	103.3	103.7	24					03/20
03/21	103.2	103.6	103.9	24	103.6	104.0	104.3	24	103.1	103.6	103.8	24	103.5	104.4	104.7	24					03/21
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

**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
03/15	100.7	101.9	103.1	24				0				0				0					100.6	100.9	101.1	24	03/15
03/16	100.8	101.9	103.4	24				0				0				0					101.3	101.7	102.0	24	03/16
03/17	101.0	102.3	103.9	24				0				0				0					101.5	101.7	101.9	24	03/17
03/18	101.0	102.4	104.1	24				0				0				0					101.8	102.3	102.5	24	03/18
03/19	101.5	102.8	104.4	24				0	103.7	103.7	105.2	9				14	104.5	104.6	105.0	24	103.4	104.1	104.6	24	03/19
03/20	102.2	103.7	105.1	24	102.6	102.8	104.3	13	102.9	103.6	104.7	24				24	105.5	105.6	106.1	24	104.8	105.0	105.3	24	03/20
03/21	103.0	104.3	105.9	24	100.4	101.5	102.9	24	102.6	103.3	104.1	24				24	105.6	105.7	105.9	24	105.0	105.2	106.1	24	03/21
03/22	103.0	104.3	105.9	24	98.8	99.5	100.2	24	102.4	103.0	103.9	24				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				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				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				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				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				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	23	96.6	99.2	99.4	19	101.3	101.6	101.9	23				23	102.0	102.3	102.5	23	101.3	101.4	101.6	23	03/28

FISH PASSAGE CENTER

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

Date 3/29/2019 7:15:08 AM

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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
03/15	101.6	101.9	102.5	24	101.1	101.4	101.9	24	101.1	101.5	101.8	24	101.4	101.7	101.9	24				0	101.6	102.0	102.3	24	03/15
03/16	101.9	102.2	102.7	24	101.4	101.8	102.1	24	101.6	101.9	102.2	24	101.9	102.2	102.4	24				0	102.4	102.9	103.3	24	03/16
03/17	102.2	102.4	102.9	24	101.7	102.0	102.3	24	101.9	102.1	102.2	24	102.1	102.3	102.7	24				0	102.9	103.3	103.8	24	03/17
03/18	102.7	103.3	104.9	24	102.0	102.6	103.2	24	102.2	102.4	102.7	24	102.7	103.0	103.2	24				0	103.7	104.2	104.6	24	03/18
03/19	103.1	103.6	104.4	24	102.6	103.1	103.6	24	102.8	103.1	103.7	24	103.3	103.6	104.1	24				0	106.4	108.7	113.9	24	03/19
03/20	103.9	104.5	106.5	24	103.3	103.8	104.0	24	103.4	103.6	104.0	18	103.9	104.3	104.8	18				0	109.4	112.5	114.3	24	03/20
03/21	104.8	106.0	108.4	24	103.9	104.3	104.6	24	104.0	104.2	104.6	19	104.5	104.8	105.2	19				0	108.1	110.3	114.4	24	03/21
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	23	102.1	102.3	102.7	23	104.4	104.6	105.0	23	104.4	104.7	105.2	23	104.5	104.6	104.9	23	113.9	114.3	115.6	23	03/28

**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
03/15				0	100.7	101.0	101.2	24	101.6	101.9	102.1	24	101.6	102.1	102.3	24	102.4	102.5	103.0	14	102.9	104.0	105.1	24	03/15
03/16				0	100.9	101.3	101.4	24	102.1	102.3	102.5	24	102.3	102.6	102.9	24	103.0	103.3	103.7	15	103.5	104.6	105.1	24	03/16
03/17				0	101.6	102.1	102.5	24	102.5	102.8	103.0	24	102.7	103.0	103.1	24	103.4	103.6	103.9	16	103.8	104.7	105.3	24	03/17
03/18				0	102.8	103.3	103.4	24	103.3	103.7	103.9	24	103.5	103.9	104.7	24	104.1	104.4	104.7	16	104.3	105.4	106.2	24	03/18
03/19				0	104.0	104.7	105.0	24	104.3	104.8	105.0	23	104.4	104.9	105.8	24	104.4	105.1	105.5	24	105.0	106.2	106.9	24	03/19
03/20				0	105.6	106.1	106.4	24	105.5	106.0	106.2	24	105.7	106.0	106.2	24	105.4	106.1	106.5	24	105.8	106.9	107.5	24	03/20
03/21				0	105.7	106.0	106.3	24	106.2	106.5	106.8	24	106.3	107.0	107.3	24	105.8	106.2	106.5	24	106.3	106.9	107.5	24	03/21
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	22	106.3	107.2	107.4	22	107.9	108.1	108.2	22	107.2	107.4	107.5	22	106.4	106.6	106.9	22	105.6	105.8	106.0	22	03/28

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

**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	
03/15	103.5	103.6	103.9	13	104.0	105.2	106.5	24				0	110.4	111.5	112.1	24	03/15
03/16	103.3	103.7	103.8	24	104.3	105.3	106.5	24				0	110.4	111.9	112.7	24	03/16
03/17	103.8	104.3	104.7	24	105.3	106.9	107.7	24				0	111.1	112.3	112.8	24	03/17
03/18	104.8	105.1	105.5	24	106.3	107.9	109.2	24	105.0	105.1	105.8	13	111.9	113.2	113.9	24	03/18
03/19	105.4	105.7	105.8	24	107.3	108.6	109.7	24	104.4	105.1	105.7	24	112.3	113.7	114.8	24	03/19
03/20	105.9	106.1	106.3	24	107.6	108.9	109.9	24	105.0	105.8	106.2	24	111.7	113.1	114.2	24	03/20
03/21	106.6	106.9	107.4	24	107.3	108.0	108.7	24	106.7	108.1	108.7	24	110.0	111.1	112.2	24	03/21
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	23	107.1	107.6	108.1	23	106.1	107.3	108.4	23	109.9	110.3	110.5	23	03/28

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 3/28/2019 2:16:19 PM

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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)
03/14/2019	460	1		0						80	5
03/15/2019	813	0		1			1,490				0
03/16/2019		1	0	8						150	11
03/17/2019		0	0	6			3,300				0
03/18/2019	566	0	0	0						130	0
03/19/2019	597	23	0	8			1,760				6
03/20/2019	385	62	3	8						100	0
03/21/2019	586	135	0	4			5,320				0
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			7	1,212					210	30
03/27/2019	816		0	3	2,720		24,200				60
03/28/2019	418		0	4	3,660					170	48
<b>Total:</b>	<b>7,799</b>	<b>793</b>	<b>8</b>	<b>65</b>	<b>7,592</b>	<b>0</b>	<b>84,970</b>	<b>0</b>	<b>0</b>	<b>985</b>	<b>236</b>
<b># Days:</b>	<b>11</b>	<b>12</b>	<b>12</b>	<b>15</b>	<b>3</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>15</b>
<b>Average:</b>	<b>709</b>	<b>66</b>	<b>1</b>	<b>4</b>	<b>2,531</b>	<b>0</b>	<b>12,139</b>	<b>0</b>	<b>0</b>	<b>123</b>	<b>16</b>
<b>YTD:</b>	<b>8,736</b>	<b>825</b>	<b>8</b>	<b>65</b>	<b>7,592</b>	<b>0</b>	<b>85,020</b>	<b>0</b>	<b>0</b>	<b>985</b>	<b>352</b>

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 3/28/2019 2:16:19 PM

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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)
03/14/2019	0	0		0						0	192
03/15/2019	0	0		0			0				124
03/16/2019		0	0	0						0	312
03/17/2019		0	0	0			0				304
03/18/2019	0	0	0	0						0	223
03/19/2019	0	0	0	1			0				248
03/20/2019	0	0	0	8						0	530
03/21/2019	0	0	0	1			0				375
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	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
<b>Total:</b>	0	0	0	27	360	0	0	0	0	155	14,705
<b># Days:</b>	11	12	12	15	3	0	7	0	0	8	15
<b>Average:</b>	0	0	0	2	120	0	0	0	0	19	980
<b>YTD:</b>	1	1	0	45	360	0	0	0	0	155	17,562

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 3/28/2019 2:16:19 PM

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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)
03/14/2019	0	0		0						0	10
03/15/2019	0	0		0			0				10
03/16/2019		0	0	0						0	5
03/17/2019		0	0	0			0				0
03/18/2019	0	0	0	0						0	5
03/19/2019	0	0	0	0			0				25
03/20/2019	0	0	0	0						0	0
03/21/2019	0	0	0	0			0				7
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			6	0					20	30
03/27/2019	0	0	0	0	0		0				10
03/28/2019	0		0	0	20					0	29
<b>Total:</b>	0	0	0	9	20	0	0	0	0	20	158
<b># Days:</b>	11	12	12	15	3	0	7	0	0	8	15
<b>Average:</b>	0	0	0	1	7	0	0	0	0	3	11
<b>YTD:</b>	0	0	0	9	20	0	0	0	0	20	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

Date 3/28/2019 2:16:19 PM

### 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)
03/14/2019	0	0		0						10	0
03/15/2019	0	0		0			6				0
03/16/2019		0	0	0						0	0
03/17/2019		0	0	0			100				0
03/18/2019	0	1	0	0						5	0
03/19/2019	0	1	0	0			2,600				0
03/20/2019	0	2	0	0						10	0
03/21/2019	0	5	2	1			1,980				0
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			12	1,853					60	0
03/27/2019	0		0	15	3,320		200				10
03/28/2019	0		2	4	6,100					0	10
<b>Total:</b>	<b>1</b>	<b>64</b>	<b>5</b>	<b>61</b>	<b>11,273</b>	<b>0</b>	<b>6,486</b>	<b>0</b>	<b>0</b>	<b>95</b>	<b>38</b>
<b># Days:</b>	<b>11</b>	<b>12</b>	<b>12</b>	<b>15</b>	<b>3</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>15</b>
<b>Average:</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>4</b>	<b>3,758</b>	<b>0</b>	<b>927</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>3</b>
<b>YTD:</b>	<b>1</b>	<b>67</b>	<b>5</b>	<b>61</b>	<b>11,273</b>	<b>0</b>	<b>6,496</b>	<b>0</b>	<b>0</b>	<b>95</b>	<b>47</b>

Number of hours sampled:

- No data available or no sample conducted

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

## Smolt Monitoring Program Two Week Passage Index Report

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### COMBINED SOCKEYE

Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (Index)	LGS (Index)	LMN (Index)	RIS (Index)	MCN (Index)	JDA (Index)	BO2 (Index)
03/14/2019	0	0		0						0	0
03/15/2019	0	0		0			4				0
03/16/2019		0	0	0						0	0
03/17/2019		0	0	0			0				0
03/18/2019	0	0	0	0						0	0
03/19/2019	0	0	0	0			0				0
03/20/2019	0	0	0	0						0	0
03/21/2019	0	0	0	0			0				0
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	10					0	0
03/27/2019	0	0	0	0	0		0				0
03/28/2019	0		0	0	0					0	0
<b>Total:</b>	0	0	0	0	10	0	4	0	0	0	0
<b># Days:</b>	0	0	0	0	3	0	1	0	0	0	0
<b>Average:</b>	0	0	0	0	3	0	1	0	0	0	0
<b>YTD:</b>	0	0	0	0	10	0	8	0	0	0	0

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 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)
03/14/2019	0	0		0						180	70
03/15/2019	0	0		0			4				20
03/16/2019		0	0	0						130	60
03/17/2019		0	0	0			200				80
03/18/2019	0	0	0	0						160	55
03/19/2019	0	0	0	0			0				80
03/20/2019	0	0	0	0						75	85
03/21/2019	0	0	0	0			0				70
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	25					6,410	250
03/27/2019	0		0	0	82		0				250
03/28/2019	0		18	0	48					1,790	320
<b>Total:</b>	0	20	66	0	155	0	204	0	0	38,610	2,070
<b># Days:</b>	11	13	14	15	6	0	7	0	0	11	21
<b>Average:</b>	0	2	5	0	26	0	29	0	0	3,510	99
<b>YTD:</b>		20	66		155		204			38,610	2,755

- 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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FISH PASSAGE CENTER

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

## Two Week Transportation Summary Report

### 3/14/2019 12:00:00 AM TO 3/28/2019 12:00:00 AM

Date 3/28/2019 2:17:56 PM

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#### Lower Granite Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	360	7,590	20	10	11,270	30,520
Sum of Number Barged	0	0	0	0	0	0
Sum of Number Bypassed	355	7,590	20	10	11,270	30,515
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	5	0	0	0	0	5
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	5	0	0	0	0	5

#### Little Goose Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	0	0	0	0	0	0
Sum of Number Barged	0	0	0	0	0	0
Sum of Number Bypassed	0	0	0	0	0	0
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	0	0	0	0	0
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	0	0	0	0	0	0

FISH PASSAGE CENTER

## Two Week Transportation Summary Report

### 3/14/2019 12:00:00 AM TO 3/28/2019 12:00:00 AM

Date 3/28/2019 2:17:56 PM

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#### Lower Monumental Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	0	84,970	0	4	6,486	97,946
Sum of Number Barged	0	0	0	0	0	0
Sum of Number Bypassed	0	84,964	0	4	6,486	97,940
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	360	92,560	20	14	17,756	128,466
Sum of Number Barged	0	0	0	0	0	0
Sum of Number Bypassed	355	92,554	20	14	17,756	128,455
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	5	6	0	0	0	11
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	5	6	0	0	0	11



## YTD Transportation Summary Report

Date 3/28/2019 2:17:33 PM

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### Lower Granite Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	360	7590	20	10	11270	30520
Sum of Number Barged	0	0	0	0	0	0
Sum of Number Bypassed	355	7590	20	10	11270	30515
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	5	0	0	0	0	5
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	5	0	0	0	0	5

### Little Goose Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	0	0	0	0	0	0
Sum of Number Barged	0	0	0	0	0	0
Sum of Number Bypassed	0	0	0	0	0	0
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	0	0	0	0	0
Sum of Reseach Morts	0	0	0	0	0	0
Sum of Total Project Mort	0	0	0	0	0	0

FISH PASSAGE CENTER

## YTD Transportation Summary Report

Date 3/28/2019 2:17:33 PM

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### Lower Monumental Dam

Data	Chinook Subyearlings	Chinook Yearlings	Coho	Sockeye	Steelhead	Grand Total
Sum of Number Collected	0	85020	0	8	6496	98020
Sum of Number Barged	0	0	0	0	0	0
Sum of Number Bypassed	0	85014	0	8	6496	98014
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	360	92610	20	18	17766	128540
Sum of Number Barged	0	0	0	0	0	0
Sum of Number Bypassed	355	92604	20	18	17766	128529
Sum of Number Trucked	0	0	0	0	0	0
Sum of Sample Morts	5	6	0	0	0	11
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	5	6	0	0	0	11

Cumulative Adult Passage at Mainstem Dams Through: 03/28

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	03/27	18	0	16	0	179	0	0	0	0	0	0	0	0	0	0	0	0	0
TDA		0	0	0	0	0	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		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LGS		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LGR	03/27	0	0	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	03/27	16	0	8	0	31	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	2018	2017					
BON	03/27	4	1	1	-1	0	0	0	0	0	1046	1448	2087	545	579	758	-39	0	0
TDA		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LGS		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LGR	03/27	0	0	0	0	0	0	0	0	0	1239	1560	4080	425	350	1417	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	03/27	0	0	0	2	7	7	0	0	0	2202	922	3046	1997	877	96	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.