



Fish Passage Center

Weekly Report #16-1

March 18, 2016

Summary of Events

Water Supply

Precipitation throughout the Columbia Basin has varied between 125% and 193% of average at individual sub-basins over March. Precipitation above The Dalles has been 175% of average over March. Over the 2016 water year, precipitation has ranged between 83% and 121% of average.

Table 1. Summary of March precipitation and cumulative October through March precipitation with respect to average (1971–2000), at select locations within the Columbia and Snake River Basins.

Location	Water Year 2016		Water Year 2016	
	March 1–16, 2016		October 1, 2015 to March 16, 2016	
	Observed (inches)	% Average	Observed (inches)	% Average
Columbia above Coulee	3.03	173	23.1	109
SNAKE RIVER above Ice Harbor	1.88	155	13.4	106
Columbia above The Dalles	2.41	175	17.7	111
Kootenai	3.05	177	23.5	112
Clark Fork	1.62	125	13.5	96
Flathead	2.78	160	21.2	111
Pend Oreille River Basin above Waneta Dam	2.59	163	18.8	106
Salmon River Basin	2.50	160	17.1	107
Upper Snake Tributaries	1.61	150	11.8	83
Clearwater	3.27	151	25.4	106
Willamette River above Portland	7.36	193	56.1	121

Snowpack within the Columbia Basin has been close to average. Snowpack in the Columbia River for basins above the Snake River confluence is 106% of average. For Snake River Basins the snowpack is 108% of average. For lower Columbia Basins between McNary and Bonneville Dam snowpack is 102% of average.

Table 2 displays the March 17th ESP runoff volume forecasts for multiple reservoirs along with the March COE forecasts at Libby and Dworshak. The March 17th ESP forecast at The Dalles between April and August is 90,409 Kaf (103% of average).

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

Location	March 17, 2016	
	% Average (1981–2010)	Runoff Volume (Kaf)
The Dalles (Apr–Aug)	103	90,409
Grand Coulee (Apr–Aug)	103	58,417
Libby Res. Inflow, MT (Apr–Aug)	97 110*	5,697 6,472*
Hungry Horse Res. Inflow, MT (Apr–Aug)	91	1,759
Lower Granite Res. Inflow (Apr–July)	103	20,346
Brownlee Res. Inflow (Apr–July)	93	5,095
Dworshak Res. Inflow (Apr–July)	103 84*	2,482 2,025*

* Denotes COE March Forecast

Grand Coulee Reservoir is at 1,253.2 feet (3-16-16) and has drafted 2.3 feet over the last week. Outflows at Grand Coulee have ranged between 100.0 and 121.3 Kcfs over the last week. The April 10th FC Elevation at Grand Coulee is currently 1,264.4 feet (based on March Final Forecast). Grand Coulee will be drafted to approximately 1,255 ft. this year for a period of 8 weeks (mid-March to mid-May) for drum gate maintenance.

The Libby Reservoir is currently at elevation 2,405.3 feet (3-16-16) and has drafted 2.7 feet over the previous week. Daily average outflows at Libby Dam have been 10.1–19.7 Kcfs over the last week. The April 10th FC Elevation at Libby is currently 2,397.8 feet (based on March Final Forecast).

Hungry Horse is currently at an elevation of 3,518.6 feet (3-16-16) and has refilled 1.1 feet over the last week. Outflows at Hungry Horse have been 1.0 Kcfs over the last week. The April 10th FC Elevation at Hungry Horse is currently 3,544.9 feet (based on March Final Forecast).

Dworshak is currently at an elevation of 1,562.7 feet (3-16-16) and has refilled 4.4 feet over the last week. Outflows have been 6.9–7.4 Kcfs over the last week. The April 10th System FC Elevation at Dworshak is currently 1,570.5 feet (based on March Final Forecast), the April 10th Local FC at Dworshak is 1,576.3 feet.

The Brownlee Reservoir was at an elevation of 2,054.6 feet on March 16, 2016, and has refilled 7.1 feet over the last week. The April 10th FC Elevation at Brownlee is currently 2,048.9 feet (based on March Final Forecast).

Smolt Monitoring

Smolt monitoring activities began at Bonneville Dam on March 2nd, with the first sample tallied and reported on March 3rd. SMP traps on the Salmon, Snake, and Grande Ronde rivers began sampling the first week of March while the Imnaha River Trap has been sampling since January 1st. Sampling at Lower Granite Dam will begin on March 26th. Sampling at all the other bypass facilities (Little Goose Dam, Lower Monumental Dam, McNary Dam, John Day Dam, and Rock Island Dam) is scheduled to begin on April 1st or soon thereafter.

Bonneville Dam is the only SMP bypass facility that has sampled so far this season. Subyearling Chinook have made up the majority of the salmonids sampled at Bonneville so far this year. Of the subyearling Chinook sampled so far this year, approximately 99.9% have been fry. Over the past week the daily average passage index for subyearling Chinook was about 1,500 per day. This week's daily average passage indices for yearling Chinook and coho at BON were about 270 and 15 per day, respectively. Small numbers of sockeye and steelhead juveniles have been sampled at BON since sampling began. Both pacific lamprey ammocoetes and macrophthalmia have been collected at BON already this year. One pacific lamprey ammocoete was sampled on

each of March 5th, March 11th, and March 12th. Pacific lamprey macrophthalmia have been encountered every day this year. The daily average collection for pacific lamprey macrophthalmia for the last week was about 90 per day.

The Grande Ronde Trap is operated by the Oregon Department of Fish and Wildlife and is located at river kilometer 2 in the Grande Ronde River. Sampling at the Grande Ronde Trap began on March 8th, with the first sample tallied and reported on March 9th. Since the beginning of sampling, collections at this trap have been dominated by yearling Chinook. To date, 127 yearling Chinook have been collected at this trap. Over the last week, the daily average collection was 13 yearling Chinook per day. In addition to yearling Chinook, Chinook fry (i.e., subyearling Chinook) and steelhead have also been collected so far this year, but in very low numbers. Finally, one pacific lamprey ammocoete was collected at the Grande Ronde trap in the sample from March 9th. This is the first time a lamprey juvenile has been collected at this trap since lamprey juveniles became a target species in 2011.

The Salmon River Trap is located at river kilometer 103 and is operated by Idaho Department of Fish and Game. Sampling at the Salmon River Trap began on March 6th, with the first sample being tallied and reported on March 7th. Similar to 2015, sampling at the Salmon River Trap in 2016 will occur only during the weekdays. To date, collections at this trap have been dominated by yearling Chinook. To date, 4,366 yearling Chinook have been collected at the Salmon River Trap. Of these, approximately 48% are of known hatchery origin. Finally, a few steelhead juveniles have been collected at this trap so far this year.

The Snake River Trap is located at river kilometer 225 and operated by Idaho Department of Fish and Game. Sampling at the Snake River Trap began on March 7th, with the first sample tallied and reported on March 8th. To date, salmonid collections at the Snake River Trap have been small, with only a few yearling Chinook, Chinook fry (i.e., subyearling Chinook), and/or steelhead being collected each day.

The Imnaha River Trap is located at river kilometer 7 and is operated by the Nez Perce Tribe. Sampling at the Imnaha River Trap is year round and, for 2016, the Fish Passage Center has been receiving data since the

January 1, 2016, sample. However, due to the remote nature of the trap, the Nez Perce Tribe is able to send collection data to the FPC only periodically. Currently, data for the Imnaha Trap are currently about 2 weeks behind. Through February 28th, samples at the Imnaha River Trap have been dominated by yearling Chinook. The only other salmonids that have been collected at this trap through February 28th are Chinook fry (i.e., subyearling Chinook) and steelhead. Collections of Chinook fry and steelhead have been very small so far this year.

Hatchery Release

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. To date, nearly 6.74 million yearling spring Chinook juveniles have been released into this zone through March 18th. Of these, about 2.7 million (40%) were scheduled for release from Rapid River Hatchery into the Little Salmon River. The volitional release of 2.5 million juveniles from Rapid River Hatchery was scheduled to begin on March 14th and is expected to run through the end of April. Rapid River Hatchery was also scheduled to release about 200,000 yearling spring Chinook to the Little Salmon River at Pinehurst Bridge and 500,000 (7%) yearling spring Chinook into the Snake River, just below Hells Canyon Dam this week. Nearly 3.3 million (49%) of the yearling spring Chinook released into this zone so far this year were released into the Clearwater River and its tributaries. These Clearwater River releases were scheduled to begin as early as March 1st. The remaining 4% of spring Chinook released to date were released into the Grande Ronde River. This release was scheduled to begin on or around March 15th. To date, approximately 1.6 million coho juveniles have been released into this zone through March 18th. All of the coho juveniles were released into tributaries of the Clearwater River. At this time, marking information for these coho releases is unknown.

There are several releases of yearling spring Chinook juveniles scheduled to take place over the next two weeks. In all, these releases will total just over 3.74 million spring Chinook juveniles. Of the 3.74 million yearling spring Chinook scheduled for

release over the next two weeks, approximately 1.9 million (51%) are scheduled for release into the Clearwater River and its tributaries, 1.62 million (43%) are scheduled for release into the Salmon River, and 220,000 (6%) are scheduled for release into the Tucannon River. Nearly 1.5 million yearling summer Chinook are also scheduled for release into this zone over the next two weeks. Of these, approximately 76% are scheduled for release from Pahsimeroi Hatchery on the Pahsimeroi River and 8% are scheduled for release into Johnson Creek, a tributary of the South Fork Salmon River. The remaining 16% of yearling summer Chinook are scheduled for release into the Lochsa River, a tributary of the Clearwater River. This is the sixth year of yearling summer Chinook releases into the Clearwater River basin. Finally, nearly 3.0 million summer steelhead are scheduled for release to this zone over the next two weeks. Of these, about 70% are scheduled for release into the Clearwater River and its tributaries, 4% are scheduled for release into the Salmon River, 7% are scheduled for release into the Grande Ronde River, and 19% are scheduled for release into the Snake River, below Hells Canyon Dam.

Mid-Columbia Zone: The Mid-Columbia Zone encompasses the area of the Columbia River and its tributaries from McNary Dam to Chief Joseph Dam.

Volitional releases totaling about 660,000 spring Chinook juveniles from Cle Elem Hatchery acclimation sites on the Yakima River were scheduled to begin on or around March 15th. These volitional releases are expected to run through mid-May. As in previous years, yearling spring Chinook released from Cle Elum Hatchery volitional release sites are marked with Elastomer tags. At this time, the color and location of these Elastomer tags is unknown. A single release of steelhead to the Methow River was also scheduled to begin earlier this month. This steelhead release totaled about 37,000 juveniles from Methow Hatchery to the Twisp Acclimation Ponds. These steelhead juveniles were unclipped but tagged with coded-wire tags.

There are several releases of juvenile salmonids scheduled for this zone over the next two weeks. First, approximately 250,000 yearling spring Chinook are scheduled to be released into the Walla Walla River on or around March 31st. Nearly 730,000 coho juveniles are scheduled to be released into the Wenatchee (53%) and Methow (47%) rivers. These coho juveniles

are part of a Yakama Tribal Program to reintroduce coho into the Wenatchee, Methow, and Yakima river basins. Finally, about 265,000 steelhead juveniles are scheduled to be released into this zone over the next two weeks. These steelhead are scheduled for release either directly into the Columbia River at Ringold Hatchery (180,000) or into the Touchet River at the Dayton Acclimation Ponds (85,000).

Lower Columbia Zone: The Lower Columbia Zone is defined as the Columbia River and its tributaries from Bonneville Dam to McNary Dam. Nearly 645,000 yearling fall Chinook were scheduled to be released into the Umatilla River on or around March 1st. An additional 265,000 yearling fall Chinook juveniles will be released into the Umatilla River on or around March 22nd. Washougal Hatchery was scheduled to release about 2.5 million coho juveniles into the Klickitat River beginning in mid-March. Finally, about 158,000 yearling spring Chinook are scheduled to be released into the Deschutes River over the next two weeks.

Adult Passage

Bonneville Dam uses video counts from January 1st through March 31st and direct counting after this period. Bonneville Dam counts adult salmon and steelhead year round. Lower Granite Dam uses video counts from March 1st through March 31st and direct counting after this period. Lower Granite Dam counts adult salmon and steelhead through December 30th each year. Willamette Falls 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 throughout the day, continuously updating our Adult Dam Count report linked on our homepage (www.fpc.org). During the winter season at Bonneville Dam (from 1/1/2016 through 3/16/2016), 48 adult Chinook and 2,081 adult steelhead were counted. In 2015 for the same time frame, 285 adult Chinook and 2,289 adult steelhead were counted. The 2016 Bonneville Dam winter season count of adult Chinook had 237 fewer fish than the 2015 count. The 2016 adult Chinook count had 208 fewer fish than the 2015 winter count.

The Willamette Falls cumulative steelhead count from January 1st through March 17th is 3,605. The 2016 Willamette Falls winter steelhead count was 1.2 times greater than the 2015 count of 2,911, while having 547 more fish than the 10-year average count of 3,058. This year's Lower Granite steelhead count of 1,778 is 64% of the 2015 count of 2,777 and has 26 fewer fish than the 10-year average count of 1,804.

This winter, based on estimates made by the Technical Advisory Committee (TAC) for U.S. v. Oregon, the spring Chinook run for 2016 is expected to be 299,200. The TAC reported that 415,100 spring Chinook had returned to the river in 2015 (see U.S. v. Oregon, Technical Advisory Committee's February 12, 2016, document *Columbia River Mouth Fish Returns* which displays 2015 actual and 2016 forecasts of spring Chinook, summer Chinook, sockeye, and steelhead counts from the Oregon and Washington Departments of Fish and Wildlife). This is available at: www.dfw.state.or.us/fish/OSCRP/CRM/returns_and_expectations/docs/15_returns_16_forecasts.pdf

The Bonneville Dam corner collector was opened on March 5th for kelt passage. Between March 1st and March 16th, a total of 55 steelhead (and 4 other salmonid species) were observed over the separator at the Bonneville Juvenile Monitoring Facility (JMF). Kelt passage at the Bonneville JMF can be found at: www.fpc.org/adultsalmon/bonkeltcounts.htm.

Hatchery Releases Last Two Weeks

Hatchery Release Summary									
From:	3/5/2016		to		03/18/16				
Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver
Idaho Dept. of Fish and Game	Clearwater Hatchery	CH1	SP	2016	767,950	03-16-16	03-18-16	Kooskia Hatchery	Clearwater River M F
Idaho Dept. of Fish and Game	Rapid River Hatchery	CH1	SP	2016	200,000	03-18-16	03-18-16	Pinehurst Bridge	Little Salmon River
Idaho Dept. of Fish and Game	Rapid River Hatchery	CH1	SP	2016	500,000	03-14-16	03-17-16	Hells Canyon Dam	Snake River
Idaho Dept. of Fish and Game	Rapid River Hatchery	CH1	SP	2016	2,500,000	03-14-16	04-29-16	Rapid River Hatchery	Little Salmon River
Idaho Dept. of Fish and Game Total					3,967,950				
Nez Perce Tribe	Cascade Hatchery	CO	UN	2016	484,000	03-07-16	03-21-16	Lapwai Creek	Clearwater River M F
Nez Perce Tribe	Clearwater Hatchery	CH1	SP	2016	450,714	03-14-16	03-15-16	Selway River	Clearwater River M F
Nez Perce Tribe	Dworshak NFH	CO	UN	2016	551,000	03-07-16	03-21-16	Kooskia Hatchery	Clearwater River M F
Nez Perce Tribe	Eagle Creek NFH	CO	UN	2016	282,000	03-07-16	03-21-16	Lapwai Creek	Clearwater River M F
Nez Perce Tribe	Eagle Creek NFH	CO	UN	2016	282,000	03-12-16	03-12-16	Clear Creek	Clearwater River M F
Nez Perce Tribe Total					2,049,714				
U.S. Fish and Wildlife Service	Kooskia NFH	CH1	SP	2016	600,000	03-18-16	03-18-16	Kooskia Hatchery	Clearwater River M F
U.S. Fish and Wildlife Service Total					600,000				
Umatilla Tribe	Lookingglass Hatchery	CH1	SP	2016	250,000	03-15-16	04-15-16	Grande Ronde Acclim Pond	Grande Ronde River
Umatilla Tribe Total					250,000				
Washington Dept. of Fish and Wildlife	Washougal Hatchery	CO	NO	2016	2,504,900	03-15-16	04-01-16	Klickitat River	Klickitat River
Washington Dept. of Fish and Wildlife Total					2,504,900				
Yakama Tribe	Cle Elem Hatchery	CH1	SP	2016	220,000	03-15-16	05-15-16	Clark Flat Acclim Pond	Yakima River
Yakama Tribe	Cle Elem Hatchery	CH1	SP	2016	220,000	03-15-16	05-15-16	Easton Pond	Yakima River
Yakama Tribe	Cle Elem Hatchery	CH1	SP	2016	220,000	03-15-16	05-15-16	Jack Creek Acclim Pond	Yakima River
Yakama Tribe Total					660,000				
Grand Total					10,032,564				

Hatchery Releases Last Two Weeks

Hatchery Release Summary									
From:	3/19/2016		to	4/1/2016					
Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver
Idaho Dept. of Fish and Game	Clearwater Hatchery	CH1	SP	2016	478,063	03-30-16	04-01-16	Mill Cr Bridge	S Fk Clearwater River
Idaho Dept. of Fish and Game	Clearwater Hatchery	CH1	SP	2016	1,234,943	03-23-16	03-29-16	Red River	S Fk Clearwater River
Idaho Dept. of Fish and Game	Clearwater Hatchery	CH1	SU	2016	237,198	03-21-16	03-22-16	Powell Acclim Pond	Lochsa River
Idaho Dept. of Fish and Game	Niagara Springs	ST	SU	2016	560,000	03-21-16	04-02-16	Hells Canyon Dam	Snake River
Idaho Dept. of Fish and Game	Pahsimeroi Hatchery	CH1	SU	2016	66,859	04-01-16	04-14-16	Pahsimeroi Hatchery	Pahsimeroi River
Idaho Dept. of Fish and Game	Pahsimeroi Hatchery	CH1	SU	2016	1,054,263	04-01-16	04-14-16	Pahsimeroi Hatchery	Pahsimeroi River
Idaho Dept. of Fish and Game	Sawtooth Hatchery	CH1	SP	2016	154,000	04-01-16	04-01-16	Sawtooth Hatchery	Salmon River (ID)
Idaho Dept. of Fish and Game	Sawtooth Hatchery	CH1	SP	2016	1,463,000	04-01-16	04-01-16	Sawtooth Hatchery	Salmon River (ID)
Idaho Dept. of Fish and Game Total					5,248,326				
Nez Perce Tribe	Cascade Hatchery	CO	UN	2016	484,000	03-07-16	03-21-16	Lapwai Creek	Clearwater River M F
Nez Perce Tribe	Dworshak NFH	CO	UN	2016	551,000	03-07-16	03-21-16	Kooskia Hatchery	Clearwater River M F
Nez Perce Tribe	Dworshak NFH	ST	SU	2016	200,000	04-01-16	04-01-16	Lolo Creek	Clearwater River M F
Nez Perce Tribe	Eagle Creek NFH	CO	UN	2016	282,000	03-07-16	03-21-16	Lapwai Creek	Clearwater River M F
Nez Perce Tribe	Lyons Ferry Hatchery	CH1	FA	2016	163,000	04-01-16	04-01-16	Cpt John Acclim Pond	Snake River
Nez Perce Tribe	McCall Hatchery	CH1	SU	2016	118,117	03-28-16	03-31-16	Johnson Cr Idaho	South Fork Salmon River
Nez Perce Tribe	Nez Perce Tribal Hatchery	CH1	SP	2016	191,372	04-01-16	04-01-16	Lolo Creek	Clearwater River M F
Nez Perce Tribe Total					1,989,489				
Oregon Dept. of Fish and Wildlife	Wizard Falls Hatchery	CH1	SP	2016	5,000	03-25-16	03-25-16	Crooked River (OR)	Deschutes River
Oregon Dept. of Fish and Wildlife	Wizard Falls Hatchery	CH1	SP	2016	5,000	03-25-16	03-25-16	Wyachus Creek	Deschutes River
Oregon Dept. of Fish and Wildlife	Wizard Falls Hatchery	CH1	SP	2016	15,000	03-25-16	03-25-16	Metolius River	Deschutes River
Oregon Dept. of Fish and Wildlife Total					25,000				
U.S. Fish and Wildlife Service	Dworshak NFH	ST	SU	2016	300,000	04-01-16	04-01-16	Clear Creek	Clearwater River M F
U.S. Fish and Wildlife Service	Dworshak NFH	ST	SU	2016	400,000	04-01-16	04-01-16	Redhouse (SFk ClearH20 R)	S Fk Clearwater River
U.S. Fish and Wildlife Service	Dworshak NFH	ST	SU	2016	1,200,000	04-01-16	04-01-16	Dworshak Hatchery	Clearwater River M F
U.S. Fish and Wildlife Service	Hagerman NFH	ST	SU	2016	129,000	03-31-16	04-03-16	McNabb/Salmon River	Salmon River (ID)
U.S. Fish and Wildlife Service	Warm Springs NFH	CH1	SP	2016	133,000	03-30-16	03-30-16	Warm Springs Hatchery	Deschutes River
U.S. Fish and Wildlife Service Total					2,162,000				
Umatilla Tribe	Bonneville Hatchery	CH1	FA	2016	265,000	03-22-16	03-22-16	Pendelton Acclim Pond	Umatilla River
Umatilla Tribe	Carson NFH	CH1	SP	2016	250,000	03-31-16	03-31-16	Walla Walla River	Walla Walla River
Umatilla Tribe Total					515,000				
Washington Dept. of Fish and Wildlife	Lyons Ferry Hatchery	ST	SU	2016	85,000	03-25-16	04-15-16	Dayton Acclim Pond	Touchet River
Washington Dept. of Fish and Wildlife	Lyons Ferry Hatchery	ST	SU	2016	200,000	03-20-16	04-07-16	Cottonwood Acclim Pond	Grande Ronde River
Washington Dept. of Fish and Wildlife	Methow Hatchery	ST	SU	2016	36,900	03-01-16	03-31-16	Twisp Acclim Pond	Methow River
Washington Dept. of Fish and Wildlife	Ringold Springs Hatchery	ST	SU	2016	180,000	04-01-16	04-30-16	Ringold Springs Hatchery	Mid-Columbia River
Washington Dept. of Fish and Wildlife	Tucannon Hatchery	CH1	SP	2016	220,000	04-01-16	04-15-16	Curl Lake Acclim Pond	Tucannon River
Washington Dept. of Fish and Wildlife	Washougal Hatchery	CO	NO	2016	2,504,900	03-15-16	04-01-16	Klickitat River	Klickitat River
Washington Dept. of Fish and Wildlife Total					3,226,800				
Yakama Tribe	Cascade Hatchery	CO	UN	2016	110,086	04-01-16	04-30-16	Leavenworth Hatchery	Wenatchee River
Yakama Tribe	Cascade Hatchery	CO	UN	2016	110,126	04-01-16	04-30-16	Leavenworth Hatchery	Wenatchee River
Yakama Tribe	Willard Hatchery	CO	UN	2016	58,499	04-01-16	04-30-16	Leavenworth Hatchery	Wenatchee River
Yakama Tribe	Willard Hatchery	CO	UN	2016	110,615	04-01-16	04-30-16	Leavenworth Hatchery	Wenatchee River
Yakama Tribe	Winthrop NFH	CO	UN	2016	38,503	04-01-16	04-30-16	Methow River	Methow River
Yakama Tribe	Winthrop NFH	CO	UN	2016	42,471	04-01-16	04-30-16	Winthrop Hatchery	Methow River
Yakama Tribe	Winthrop NFH	CO	UN	2016	47,124	04-01-16	04-30-16	Methow River	Methow River
Yakama Tribe	Winthrop NFH	CO	UN	2016	212,356	04-01-16	04-30-16	Winthrop Hatchery	Methow River
Yakama Tribe Total					729,780				
Grand Total					13,896,395				

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
03/04/2016	117.7	0.0	122.2	0.0	126.1	0.0	130.2	0.0	143.0	0.1	151.4	0.0	149.0	0.0
03/05/2016	90.3	0.0	89.6	0.0	101.7	0.0	104.2	0.0	114.6	0.0	131.2	0.0	132.8	0.0
03/06/2016	94.3	0.0	95.4	0.0	89.6	0.0	85.2	0.0	95.7	0.0	98.2	0.0	104.0	0.0
03/07/2016	116.5	0.0	118.4	0.0	119.4	0.0	115.6	0.0	126.0	0.5	112.8	0.0	103.8	0.0
03/08/2016	115.2	0.0	125.2	0.0	127.9	0.0	129.1	0.0	143.0	0.0	135.0	0.0	130.7	0.0
03/09/2016	112.2	0.0	107.2	0.0	115.3	0.0	117.0	0.0	131.2	0.0	150.9	0.0	147.4	0.0
03/10/2016	115.4	0.0	115.9	3.1	116.8	0.0	114.0	0.0	123.7	0.1	126.4	0.0	121.8	0.0
03/11/2016	121.3	0.0	124.1	0.0	128.2	0.0	127.2	0.0	137.4	0.0	135.5	0.0	136.8	0.0
03/12/2016	102.4	0.0	104.9	0.0	108.6	0.0	106.9	0.0	119.2	0.0	120.6	0.0	119.1	0.0
03/13/2016	114.7	0.0	115.5	0.0	114.8	0.0	112.3	0.0	123.7	0.0	120.1	0.0	117.3	0.0
03/14/2016	117.0	0.0	119.5	0.0	122.5	0.8	117.4	5.5	125.7	0.0	125.8	7.0	130.0	4.3
03/15/2016	114.7	0.0	115.2	0.0	114.8	0.7	116.2	5.4	127.7	0.2	134.7	12.0	128.3	0.5
03/16/2016	100.2	0.0	101.9	0.0	108.1	0.0	107.6	0.7	119.5	0.4	132.8	6.6	130.6	2.5
03/17/2016	114.4	0.0	115.9	0.0	120.6	5.4	119.8	4.5	129.2	0.7	123.3	5.3	123.2	3.4

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
03/04/2016	1.6	0.0	---	19.4	40.4	0.0	40.8	0.0	41.1	0.0	40.1	0.0
03/05/2016	1.6	0.0	---	19.6	42.7	0.0	45.2	0.0	46.5	0.0	49.0	0.0
03/06/2016	1.6	0.0	---	20.5	47.7	0.0	52.3	0.0	52.7	0.0	51.7	0.0
03/07/2016	5.0	0.5	---	21.7	48.5	0.0	50.0	0.0	51.7	0.0	51.6	0.0
03/08/2016	6.6	2.1	---	21.5	61.9	0.0	57.9	0.0	62.5	0.0	63.9	0.0
03/09/2016	6.9	2.4	---	20.8	57.0	0.0	56.0	0.0	60.2	0.0	59.5	0.0
03/10/2016	6.9	2.4	---	19.9	57.1	2.8	56.9	2.4	57.3	2.3	57.1	3.6
03/11/2016	6.9	2.4	---	20.8	58.3	0.0	60.8	0.0	62.5	0.0	64.0	0.0
03/12/2016	7.4	3.0	---	20.1	58.9	0.0	57.2	0.0	57.7	0.0	59.4	0.0
03/13/2016	7.3	2.9	---	23.3	59.4	0.0	53.2	0.0	54.2	0.0	53.2	0.0
03/14/2016	7.3	2.9	---	16.8	64.2	0.0	61.2	0.0	63.7	0.0	61.9	0.0
03/15/2016	7.3	2.9	---	18.4	62.4	0.0	60.4	0.0	66.4	5.3	65.0	0.0
03/16/2016	7.3	2.8	---	22.9	55.7	0.0	53.9	0.0	54.5	0.0	57.2	0.0
03/17/2016	7.8	2.8	---	23.6	59.2	0.0	54.7	0.0	57.4	0.0	58.6	0.0

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

Date	McNary		John Day		The Dalles		Bonneville		PH1	PH2
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill		
03/04/2016	187.9	0.0	183.4	0.0	183.4	0.0	206.9	1.2	83.9	114.4
03/05/2016	196.1	0.0	204.2	0.0	202.6	0.0	218.9	1.2	89.2	119.0
03/06/2016	182.3	0.0	192.1	0.0	192.9	0.0	216.4	1.2	85.5	117.7
03/07/2016	168.7	0.0	176.4	0.0	179.4	0.0	213.3	1.2	82.8	117.3
03/08/2016	190.5	0.0	203.6	0.0	201.8	0.0	220.3	1.2	82.9	124.2
03/09/2016	212.0	0.0	228.4	0.0	229.2	0.0	236.5	1.3	94.9	128.4
03/10/2016	215.7	7.2	210.2	4.2	213.6	8.3	247.1	14.9	88.7	131.6
03/11/2016	225.9	0.0	227.1	0.0	227.3	0.0	248.9	1.3	93.5	142.1
03/12/2016	203.0	0.0	218.6	0.0	223.9	0.0	246.1	1.2	95.7	137.2
03/13/2016	174.2	0.0	189.6	0.0	192.0	0.0	221.3	1.3	86.8	121.2
03/14/2016	189.3	0.1	190.2	0.0	188.5	0.0	200.4	1.2	79.9	107.3
03/15/2016	217.1	0.0	204.1	0.0	206.3	0.0	228.3	1.2	90.1	125.0
03/16/2016	194.7	2.6	190.8	0.0	195.5	0.0	235.3	1.2	98.9	123.2
03/17/2016	193.4	0.0	203.9	0.0	202.7	0.0	226.5	1.2	79.2	133.9

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

Total Dissolved Gas Saturation Data at Upper Columbia River Sites

Date	<u>Hungry H. Dnst</u>			<u>Boundary</u>			<u>Grand Coulee</u>			<u>Grand C. Tlwr</u>			<u>Chief Joseph</u>							
	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>
	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>
3/4	---	---	---	0	---	---	---	0	100.9	101.4	101.7	24	100.0	100.4	100.5	24	99.7	100.3	100.7	24
3/5	---	---	---	0	---	---	---	0	102.3	102.8	103.2	24	101.6	102.0	102.4	24	101.2	101.5	102.1	24
3/6	---	---	---	0	---	---	---	0	102.5	102.9	103.4	24	102.1	102.7	103.1	24	101.8	102.0	102.4	24
3/7	---	---	---	0	---	---	---	0	101.7	101.9	102.2	24	100.7	101.0	101.4	24	101.0	101.3	101.4	24
3/8	---	---	---	0	---	---	---	0	101.5	101.8	102.1	24	100.3	100.7	100.8	24	100.9	101.1	101.3	24
3/9	---	---	---	0	---	---	---	0	101.8	102.2	102.6	24	100.9	101.3	101.7	24	100.8	101.1	101.5	24
3/10	99.2	99.5	101.6	18	---	---	---	0	102.1	102.4	102.8	24	101.4	102.0	102.9	24	101.0	101.3	101.6	24
3/11	98.8	99.3	99.9	24	---	---	---	0	102.0	102.7	103.2	24	101.3	101.8	102.2	24	101.1	101.7	101.9	24
3/12	99.1	99.5	100.0	24	---	---	---	0	102.7	102.9	102.9	24	102.1	102.3	102.5	24	102.1	102.3	102.5	24
3/13	99.2	99.7	100.3	23	---	---	---	0	103.0	103.5	103.8	23	102.3	102.7	103.1	23	101.8	102.2	102.4	23
3/14	99.1	99.3	99.7	24	---	---	---	0	102.4	102.7	102.9	24	101.7	102.0	102.2	24	101.3	101.5	102.0	24
3/15	98.3	98.6	99.0	24	---	---	---	0	101.7	102.1	102.6	24	100.9	101.1	101.4	24	100.4	100.6	100.6	24
3/16	98.2	98.5	98.8	24	---	---	---	0	101.6	102.1	102.7	24	100.9	101.2	101.6	24	100.2	100.4	100.6	24
3/17	98.0	98.4	98.8	23	---	---	---	0	101.3	101.5	101.9	23	100.7	101.1	101.7	23	100.2	100.4	100.6	23

Total Dissolved Gas Saturation Data at Mid Columbia River Sites

Date	<u>Chief J. Dnst</u>			<u>Wells</u>			<u>Wells Dwnstrm</u>			<u>Rocky Reach</u>			<u>Rocky R. Tlwr</u>							
	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>
	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>
3/4	---	---	---	0	99.7	100.0	100.4	19	100.1	100.5	101.1	19	100.6	101.1	101.6	24	101.4	101.9	102.5	24
3/5	---	---	---	0	101.1	101.5	101.8	24	101.5	102.0	102.3	24	102.1	102.5	103.0	24	102.9	103.2	103.9	24
3/6	---	---	---	0	101.8	102.0	102.2	24	102.2	102.5	102.9	24	102.6	102.9	103.3	24	103.1	103.5	104.0	24
3/7	---	---	---	0	100.7	101.0	101.2	23	101.1	101.4	101.8	23	101.5	101.7	101.9	24	102.2	102.4	102.6	24
3/8	---	---	---	0	100.2	100.4	100.8	24	100.7	101.0	101.4	24	101.1	101.3	101.4	24	102.0	102.1	102.2	24
3/9	---	---	---	0	100.5	100.8	101.1	24	100.8	101.2	101.5	24	101.2	101.6	102.0	24	102.0	102.3	102.7	24
3/10	---	---	---	0	100.6	101.0	101.1	24	101.2	101.5	101.8	24	101.5	101.8	102.2	24	102.2	102.5	103.0	24
3/11	---	---	---	0	100.6	101.0	101.2	24	101.0	101.5	101.6	24	101.5	102.0	102.2	24	102.2	102.6	102.9	24
3/12	---	---	---	0	101.2	101.4	101.6	24	101.7	101.9	102.2	24	102.0	102.1	102.2	24	102.7	102.8	102.9	24
3/13	---	---	---	0	101.3	101.7	101.9	23	101.7	102.1	102.5	23	102.0	102.4	102.6	23	102.7	103.0	103.2	23
3/14	---	---	---	0	100.2	100.5	101.1	24	101.0	101.3	102.4	24	101.1	101.5	101.9	24	102.7	103.8	115.0	24
3/15	---	---	---	0	99.7	99.9	100.1	22	100.5	101.0	102.0	22	100.2	100.3	100.5	24	103.3	105.7	118.5	24
3/16	---	---	---	0	99.8	100.2	100.5	24	100.3	100.8	101.2	24	100.1	100.5	100.7	24	101.8	102.8	108.6	24
3/17	---	---	---	0	99.8	100.1	101.2	20	102.1	103.8	108.4	20	100.4	100.5	100.7	23	102.8	104.3	113.9	23

Total Dissolved Gas Saturation at Mid Columbia River Sites

Date	<u>Rock Island</u>			<u>Rock I. Tlwr</u>			<u>Wanapum</u>			<u>Wanapum Tlwr</u>			<u>Priest Rapids</u>							
	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>
	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>
3/4	100.3	100.9	101.2	24	100.5	100.9	101.4	24	101.9	102.2	102.6	24	101.9	102.2	102.6	24	101.4	101.7	102.1	24
3/5	101.9	102.5	103.0	24	101.9	102.5	103.2	24	102.8	103.1	103.6	24	103.1	103.4	103.9	24	102.6	102.9	103.4	24
3/6	102.2	102.5	103.0	24	102.3	102.7	103.2	24	103.0	103.3	103.7	24	103.3	103.6	104.0	24	102.7	103.1	103.6	24
3/7	101.0	101.2	101.6	24	101.3	101.6	102.2	24	96.6	96.7	96.9	24	---	---	---	0	101.7	102.1	102.4	24
3/8	100.7	101.0	101.2	24	100.8	101.1	101.2	24	101.6	101.8	101.9	24	101.7	101.9	102.0	24	101.2	101.4	101.5	24
3/9	100.7	101.0	101.4	24	100.9	101.2	101.6	24	101.9	102.1	102.5	24	102.0	102.3	102.7	24	101.5	101.8	102.2	24
3/10	101.1	101.4	101.5	24	101.3	101.7	102.6	24	101.7	102.1	102.5	24	102.0	102.4	102.8	24	101.4	101.8	102.3	24
3/11	101.0	101.6	101.8	24	101.2	101.8	101.9	24	101.8	102.2	102.3	24	101.9	102.3	102.4	24	101.4	101.8	101.9	24
3/12	101.6	101.7	101.9	24	101.8	101.9	102.0	24	102.2	102.4	102.4	24	102.4	102.5	102.6	24	101.8	101.9	102.0	24
3/13	101.5	101.8	102.0	23	101.7	102.0	102.2	23	102.3	102.6	102.8	23	102.4	102.8	102.9	23	102.0	102.3	102.5	23
3/14	100.8	101.0	101.5	24	101.0	101.2	101.8	24	101.1	101.4	102.0	24	102.2	102.8	104.3	24	101.0	101.3	101.9	24
3/15	101.6	103.2	107.6	24	101.8	103.4	107.1	24	100.9	101.3	101.8	24	102.3	104.3	115.6	24	100.7	101.2	101.6	24
3/16	100.3	100.8	101.6	24	100.5	101.0	102.5	24	---	---	---	0	---	---	---	0	---	---	---	0
3/17	100.4	101.1	104.6	23	100.7	101.4	103.7	23	---	---	---	0	---	---	---	0	---	---	---	0

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

Total Dissolved Gas Saturation Data at Lower Columbia and Snake River Sites

Date	Priest R. Dnst			Pasco			Dworshak			Clrwtr-Peck			Anatone			#				
	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					
3/4	101.1	101.5	102.0	24	---	---	---	0	105.0	105.9	106.9	24	---	---	---	0	---	---	---	0
3/5	102.3	102.5	103.0	24	---	---	---	0	106.0	106.6	106.9	24	---	---	---	0	---	---	---	0
3/6	102.3	102.6	103.0	24	---	---	---	0	106.1	106.6	107.0	24	---	---	---	0	---	---	---	0
3/7	101.3	101.5	101.7	24	---	---	---	0	98.8	100.6	104.5	24	---	---	---	0	---	---	---	0
3/8	100.9	101.1	101.2	24	---	---	---	0	104.0	105.0	105.8	24	---	---	---	0	---	---	---	0
3/9	101.2	101.4	101.8	24	---	---	---	0	105.4	105.8	106.2	24	---	---	---	0	---	---	---	0
3/10	101.0	101.4	101.9	24	---	---	---	0	105.7	106.1	106.5	24	---	---	---	0	---	---	---	0
3/11	101.2	101.6	101.7	24	---	---	---	0	105.5	106.0	106.4	24	---	---	---	0	---	---	---	0
3/12	101.4	101.6	101.7	24	---	---	---	0	107.0	107.4	107.6	24	---	---	---	0	---	---	---	0
3/13	101.5	101.9	102.1	23	---	---	---	0	106.5	106.8	107.2	23	---	---	---	0	---	---	---	0
3/14	100.7	101.0	101.1	24	---	---	---	0	105.7	105.9	106.2	24	---	---	---	0	---	---	---	0
3/15	101.6	102.9	107.3	24	---	---	---	0	104.6	104.8	105.0	24	101.8	101.8	102.3	9	---	---	---	0
3/16	---	---	---	0	---	---	---	0	103.8	104.1	104.5	24	101.6	102.2	102.7	24	101.9	102.0	102.5	15
3/17	---	---	---	0	---	---	---	0	103.1	104.4	105.7	23	101.3	101.8	102.4	23	101.7	102.0	102.6	23

Total Dissolved Gas Saturation Data at Snake River Sites

Date	Clrwtr-Lewiston			Lower Granite			L. Granite Tlwr			Little Goose			L. Goose Tlwr			#				
	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					
3/4	---	---	---	0	---	---	---	0	101.7	102.1	102.4	24	---	---	---	0	102.0	102.5	102.8	24
3/5	---	---	---	0	---	---	---	0	102.8	103.1	103.6	24	---	---	---	0	103.4	103.9	104.4	24
3/6	---	---	---	0	---	---	---	0	102.9	103.3	103.9	24	---	---	---	0	103.6	103.9	104.4	24
3/7	---	---	---	0	---	---	---	0	101.9	102.2	102.4	24	---	---	---	0	102.6	102.9	103.1	24
3/8	---	---	---	0	---	---	---	0	101.4	101.7	101.8	24	---	---	---	0	101.9	102.1	102.7	24
3/9	---	---	---	0	---	---	---	0	101.4	101.5	101.6	24	---	---	---	0	101.9	102.3	102.6	24
3/10	---	---	---	0	---	---	---	0	101.8	103.2	109.6	24	---	---	---	0	102.6	103.6	107.7	24
3/11	---	---	---	0	---	---	---	0	100.9	101.6	101.8	24	---	---	---	0	101.8	102.2	102.5	24
3/12	---	---	---	0	---	---	---	0	101.7	102.0	102.5	24	---	---	---	0	101.9	102.2	103.6	24
3/13	---	---	---	0	---	---	---	0	101.5	101.8	102.2	23	---	---	---	0	101.7	102.0	102.5	23
3/14	---	---	---	0	---	---	---	0	100.6	100.9	101.7	24	100.6	100.8	101.2	14	100.4	100.9	101.2	24
3/15	100.6	100.6	101.2	11	---	---	---	0	99.3	99.4	99.8	24	99.6	99.7	99.9	24	98.9	99.0	99.3	24
3/16	100.7	101.6	101.9	22	100.0	100.0	100.1	11	99.2	99.5	99.6	24	99.5	99.8	100.3	24	98.8	98.9	99.1	24
3/17	101.5	101.9	102.5	21	99.6	99.8	99.9	23	99.2	99.3	99.8	23	99.2	99.5	100.3	23	98.5	98.7	98.9	23

Total Dissolved Gas Saturation Data at Snake and Lower Columbia River Sites

Date	Lower Mon.			L. Mon. Tlwr			Ice Harbor			Ice Harbor Tlwr			McNary-Oregon			#				
	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					
3/4	---	---	---	0	101.0	101.6	102.1	24	---	---	---	0	101.6	102.0	102.3	24	---	---	---	0
3/5	---	---	---	0	102.6	103.1	103.8	24	---	---	---	0	102.7	103.1	103.6	24	---	---	---	0
3/6	---	---	---	0	103.1	103.3	103.8	24	---	---	---	0	102.5	102.8	103.3	24	---	---	---	0
3/7	---	---	---	0	102.3	102.5	102.8	24	---	---	---	0	101.4	101.7	102.1	24	---	---	---	0
3/8	---	---	---	0	102.1	102.3	102.4	24	---	---	---	0	101.0	101.3	101.4	24	---	---	---	0
3/9	---	---	---	0	102.6	103.0	103.4	24	---	---	---	0	101.8	102.3	102.8	24	---	---	---	0
3/10	---	---	---	0	104.0	105.6	112.2	24	---	---	---	0	103.4	104.8	112.0	24	---	---	---	0
3/11	---	---	---	0	102.7	103.1	103.4	24	---	---	---	0	102.4	102.9	103.1	24	---	---	---	0
3/12	---	---	---	0	102.4	102.7	102.9	24	---	---	---	0	102.7	102.9	102.9	24	---	---	---	0
3/13	---	---	---	0	102.8	103.1	103.5	23	---	---	---	0	103.3	103.7	104.1	23	---	---	---	0
3/14	101.2	101.2	101.5	11	101.2	101.7	102.3	24	---	---	---	0	101.7	102.2	102.7	24	---	---	---	0
3/15	100.4	100.5	100.8	24	102.6	105.4	109.4	24	---	---	---	0	100.2	100.3	100.5	24	---	---	---	0
3/16	100.0	100.2	100.9	24	99.5	99.7	100.0	24	---	---	---	0	100.0	100.3	100.5	24	---	---	---	0
3/17	99.7	99.8	100.1	23	99.2	99.3	99.4	23	---	---	---	0	100.2	100.7	101.0	23	---	---	---	0

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

Total Dissolved Gas Saturation Data at Lower Columbia River Sites

Date	<u>McNary-Wash</u>			<u>McNary Tlwr</u>			<u>John Day</u>			<u>John Day Tlwr</u>			<u>The Dalles</u>							
	<u>24 h</u>	<u>12 h</u>	<u>High</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>High</u>	<u>#</u>	<u>24h</u>	<u>12h</u>	<u>High</u>	<u>#</u>	<u>24h</u>	<u>12h</u>	<u>High</u>	<u>#</u>				
	<u>Avg</u>	<u>Avg</u>		<u>hr</u>	<u>Avg</u>	<u>Avg</u>		<u>hr</u>	<u>Avg</u>	<u>Avg</u>		<u>hr</u>	<u>Avg</u>	<u>Avg</u>		<u>hr</u>				
3/4	---	---	---	0	103.6	104.0	104.4	24	---	---	---	0	102.9	103.5	103.9	24	---	---	---	0
3/5	---	---	---	0	104.8	105.4	105.8	24	---	---	---	0	104.3	104.9	105.4	24	---	---	---	0
3/6	---	---	---	0	104.7	105.0	105.6	24	---	---	---	0	104.0	104.3	105.1	24	---	---	---	0
3/7	---	---	---	0	103.4	103.8	104.3	24	---	---	---	0	102.9	103.2	103.7	24	---	---	---	0
3/8	---	---	---	0	102.7	103.0	103.2	24	---	---	---	0	102.6	102.9	103.2	24	---	---	---	0
3/9	---	---	---	0	103.0	103.4	103.7	24	---	---	---	0	103.3	103.8	104.0	24	---	---	---	0
3/10	---	---	---	0	104.4	106.1	113.3	24	---	---	---	0	104.9	106.7	111.9	24	---	---	---	0
3/11	---	---	---	0	103.2	103.5	103.7	24	---	---	---	0	103.2	103.5	103.6	24	---	---	---	0
3/12	---	---	---	0	102.7	103.1	103.4	24	---	---	---	0	102.9	103.2	103.3	24	---	---	---	0
3/13	---	---	---	0	102.9	103.2	103.6	23	---	---	---	0	102.8	103.1	103.4	23	---	---	---	0
3/14	---	---	---	0	101.7	102.1	102.7	24	101.7	101.7	104.0	10	101.4	101.8	102.3	24	---	---	---	0
3/15	---	---	---	0	100.7	100.8	100.9	24	100.8	100.9	101.1	24	100.6	100.7	100.7	24	100.4	100.4	100.5	15
3/16	---	---	---	0	102.1	103.7	109.6	24	100.8	100.9	101.1	24	100.5	100.7	101.0	24	100.6	100.8	101.0	24
3/17	---	---	---	0	101.2	101.5	101.6	23	100.5	100.8	101.1	23	100.4	100.8	101.2	23	100.5	100.6	100.7	23

Total Dissolved Gas Saturation Data at Lower Columbia River Sites

Date	<u>The Dalles Dnst</u>			<u>Bonneville</u>			<u>Warrendale</u>			<u>Camas\Washougal</u>			<u>Cascade Island</u>							
	<u>24 h</u>	<u>12 h</u>	<u>High</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>High</u>	<u>#</u>	<u>24h</u>	<u>12h</u>	<u>High</u>	<u>#</u>	<u>24h</u>	<u>12h</u>	<u>High</u>	<u>#</u>				
	<u>Avg</u>	<u>Avg</u>		<u>hr</u>	<u>Avg</u>	<u>Avg</u>		<u>hr</u>	<u>Avg</u>	<u>Avg</u>		<u>hr</u>	<u>Avg</u>	<u>Avg</u>		<u>hr</u>				
3/4	102.1	102.5	102.6	24	---	---	---	0	104.3	104.7	104.9	24	---	---	---	0	---	---	---	0
3/5	103.3	103.8	104.0	24	---	---	---	0	105.3	106.0	106.5	24	---	---	---	0	---	---	---	0
3/6	103.1	103.3	103.8	24	---	---	---	0	105.1	105.2	105.5	24	---	---	---	0	---	---	---	0
3/7	102.3	102.6	102.7	24	---	---	---	0	104.0	104.2	104.8	24	---	---	---	0	---	---	---	0
3/8	101.8	102.0	102.1	24	---	---	---	0	104.2	104.7	105.4	24	---	---	---	0	---	---	---	0
3/9	102.2	102.5	102.7	24	---	---	---	0	104.2	104.5	104.8	24	---	---	---	0	---	---	---	0
3/10	102.7	103.4	105.1	24	---	---	---	0	104.2	104.9	106.7	24	---	---	---	0	---	---	---	0
3/11	102.7	103.2	103.8	24	---	---	---	0	104.3	104.5	104.7	24	---	---	---	0	---	---	---	0
3/12	102.2	102.5	102.7	24	---	---	---	0	104.8	105.2	105.9	24	---	---	---	0	---	---	---	0
3/13	102.4	102.7	102.9	23	---	---	---	0	104.7	104.9	105.2	23	---	---	---	0	---	---	---	0
3/14	100.9	101.3	101.6	24	---	---	---	0	103.1	103.4	104.0	24	---	---	---	0	---	---	---	0
3/15	99.7	99.9	100.0	24	101.5	101.5	102.7	11	102.8	102.9	103.1	24	---	---	---	0	106.3	106.3	107.0	8
3/16	99.9	100.1	100.4	24	101.5	101.8	102.0	24	102.5	102.7	103.0	24	103.1	103.1	103.6	9	106.2	107.1	107.6	24
3/17	99.9	99.9	100.2	23	101.5	101.8	102.0	23	102.1	102.4	102.6	23	102.5	102.9	103.5	23	106.2	107.1	107.4	23

Two-Week Summary of Passage Indices

* See sampling comments

<http://www.fpc.org/currentDaily/smpcomments.htm>

Smolt indices, clipped & unclipped or combined, are presented in the following order: yearling chinook (chinook 1's,) subyearling chinook (chinook 0's), steelhead, coho, sockeye, and lamprey juveniles.

Two 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.

The classes of counts presented in the report are defined below for each site. 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.

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.

† In 2013 it was confirmed that 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.

Definitions for Smolt Index Counts

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

Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill)}

LGS (Index) = Little Goose Bypass Collection System : Passage Index Counts

Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill)}

LMN (Index) = Lower Monumental Dam Bypass Collection System : Passage Index Counts

Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill)}

RIS (Index) = Rock Island Dam Second Powerhouse Bypass Trap : Passage Index Counts

Passage Index = Collection Counts / {Powerhouse 2 Flow / (Powerhouse 1 & 2 Flow + Spill)}

MCN (Index) = McNary Dam Bypass Collection System : Passage Index Counts

Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill)}

JDA (Index) = John Day Dam Bypass Collection System : Passage Index Counts

Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill)}

BO2 (Index) = Bonneville Dam Second Powerhouse Bypass Collection System : Passage Index Counts

Passage Index = Collection Counts / {Powerhouse 2 Flow / (Powerhouse 1 & 2 Flow + Spill)}

JDA and BO2 data collected for the FPC by Pacific States Marine Fisheries Commission.

RIS data collected for the FPC by Chelan Co. PUD.

LGR, LMN, and MCN data collected for the FPC by Washington Dept. of Fish and Wildlife.

LGS and GRN data collected for the FPC by Oregon Dept. of Fish and Wildlife.

IMN data collected for the FPC by the Nez Perce Tribe.

Fall (post SMP season) trapping at the Imnaha River Fish Trap (IMN) is funded by the Lower Snake River Compensation Program (LSRCP)

WTB and LEW data collected for the FPC by Idaho Dept. of Fish and Game.

Cumulative Adult Passage at Mainstem Dams Through: 03/17

DAM	END DATE	Spring Chinook						Summer Chinook						Fall Chinook					
		2016		2015		10-Yr Avg.		2016		2015		10-Yr Avg.		2016		2015		10-Yr Avg.	
		Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack
BON	03/16	48	2	285	2	49	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		0	0	0	0	0	0	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		0	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	03/16	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LGR	03/15	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	03/17	4	0	29	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0

DAM	END DATE	Coho						Sockeye			Steelhead						Lamprey		
		2016		2015		10-Yr Avg.		2016		10-Yr Avg.	2016		Wild	Wild	10-Yr	2016		10-Yr	
		Adult	Jack	Adult	Jack	Adult	Jack	2016	2015	Avg.	2016	2015	Avg.	2016	2015	Avg.	2016	2015	Avg.
BON	03/16	0	0	0	0	0	0	1	1	0	2081	2289	1565	877	1205	490	-1	0	0
TDA		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
JDA		0	0	0	0	0	0	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		0	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	03/16	0	0	0	0	0	0	0	0	0	1033	0	0	537	0	0	0	0	0
LGR	03/15	0	0	0	0	0	0	0	0	0	1778	2777	1804	784	945	486	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	03/17	0	0	1	0	0	0	0	0	0	3605	2911	3058	0	0	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.