



Fish Passage Center

Weekly Report #16-2

March 25, 2016

Summary of Events

Water Supply

Precipitation throughout the Columbia Basin has varied between 118% and 164% of average at individual sub-basins over March. Precipitation above The Dalles has been 154% of average over March. Over the 2016 water year, precipitation has ranged between 84% and 120% 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 1–23, 2016		October 1, 2015 to March 23, 2016	
	Observed (inches)	% Average	Observed (inches)	% Average
Columbia above Coulee	3.84	153	23.9	109
Snake River above Ice Harbor	2.52	144	14.1	106
Columbia above The Dalles	3.05	154	18.4	110
Kootenai	3.58	144	24.0	111
Clark Fork	2.42	130	14.3	98
Flathead	3.76	151	22.2	111
Pend Oreille River Basin above Waneta Dam	3.54	155	19.7	107
Salmon River Basin	3.22	143	17.8	107
Upper Snake Tributaries	2.31	118	12.4	84
Clearwater	5.03	161	27.2	110
Willamette River above Portland	9.01	164	57.7	120

Snowpack within the Columbia Basin has been slightly above 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 104% of average.

Table 2 displays the March 24th ESP runoff volume forecasts for multiple reservoirs along with the March COE forecasts at Libby and Dworshak. The March 24th ESP forecast at The Dalles between April and August is 91,038 Kaf (104% of average).

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

Location	March 24, 2016	
	% Average (1981–2010)	Runoff Volume (Kaf)
The Dalles (Apr–Aug)	104	91,038
Grand Coulee (Apr–Aug)	104	58,916
Libby Res. Inflow, MT (Apr–Aug)	98 110*	5,765 6,472*
Hungry Horse Res. Inflow, MT (Apr–Aug)	96	1,862
Lower Granite Res. Inflow (Apr–July)	102	20,332
Brownlee Res. Inflow (Apr–July)	91	4,989
Dworshak Res. Inflow (Apr–July)	106 84*	2,554 2,025*

* Denotes COE March Forecast

Grand Coulee Reservoir is at 1,253.1 feet (3-24-16) and has refilled 0.4 feet over the last week. Outflows at Grand Coulee have ranged between 85.9 and 110.5 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 2,400.0 feet (3-24-16) and has drafted 3.6 feet over the previous week. Daily average outflows at Libby Dam have been 15.0–19.5 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 (3-24-16) and has drafted 0.3 feet over the last week. Outflows at Hungry Horse have been 1.0–3.2 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 1,564.4 feet (3-24-16) and has refilled 1.3 feet over the last week. Outflows have been 8.0–10.0 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 2,049.7 feet on March 24, 2016, and has drafted 4.6 feet over the last week. The April 10th FC Elevation at Brownlee is currently 2,057.6 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 99.8% have been fry. This week's daily average passage index for subyearling Chinook was about 750 per day, which is a decrease from last week's daily average passage index of about 1,500 per day. This week's daily average passage index for yearling Chinook at BON was about 490, which is an increase from last week's daily average passage index of about 270. Coho, sockeye, and steelhead juveniles were also collected at BON this week, but in small numbers. This week's collections also contained both Pacific lamprey ammocoetes and

macrophthalmia. One Pacific lamprey ammocoete was sampled on each of March 20th and March 24th. This equated to an estimated collection of five ammocoetes each day. Pacific lamprey macrophthalmia were encountered every day this week. The daily average collection for Pacific lamprey macrophthalmia for this week was about 180 per day, which is an increase over last week's daily average collection of 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. Yearling Chinook continued to dominate the collections this week. In fact, collections of yearling Chinook increased substantially on March 23rd and 24th, with the arrival of hatchery Chinook from upstream releases. The daily average collection for yearling Chinook this week was 75 per day. The only other salmonids that were encountered in this week's samples were a few subyearling Chinook fry on March 20th and 22nd.

The Salmon River Trap is located at river kilometer 103 and 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 is five days per week. Yearling Chinook continued to dominate this week's collections. In fact, yearling Chinook were the only salmonids collected at this trap this week. This week's daily average collection for yearling Chinook was about 1,420 per day, which is an increase over last week's daily average collection of about 930 per day. The increase in the yearling Chinook collection is largely due to the start of the upstream volitional release of approximately 2.5 million juveniles from Rapid River Hatchery, which began on March 14th.

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 relatively low, with yearling Chinook dominating the collections. Other than yearling Chinook, a few Chinook fry (i.e., subyearling Chinook), coho, and/or steelhead were collected each day this week.

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, the FPC has data from Imnaha Trap only through March 6th. Through March 6th, samples at the Imnaha River Trap have been dominated by yearling Chinook. The only other salmonids that have been collected at this trap, through March 6th are a small number of Chinook fry (i.e., subyearling Chinook) and steelhead.

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. Approximately 2.7 million yearling spring Chinook were scheduled for release this week. All of these spring Chinook juveniles were scheduled to be released into the Clearwater River and its tributaries. In addition, just over 237,000 yearling summer Chinook were scheduled to be released into the Lochsa River this week. The Lochsa River is a tributary of the Clearwater River and 2016 marks the sixth year of yearling summer Chinook releases into the Clearwater River basin. The summer Chinook juveniles released into the Lochsa River were 100% unclipped but 100% tagged with coded-wire tags. Finally, about 760,000 summer steelhead juveniles were scheduled for release into this zone this week. Of these, about 560,000 (74%) were scheduled to be released into the Snake River below Hells Canyon Dam, while the remaining 200,000 (26%) were scheduled to be released into the Grand Ronde River.

Approximately 650,000 yearling fall Chinook juveniles are scheduled for release to this zone over the next two weeks. Of these, 487,000 (75%) will be released from Lyons Ferry Hatchery, which is located on the Snake River above Lower Monumental Dam. The remaining 163,000 (25%) are scheduled to be released from Captain John Rapids Acclimation Facility, above Lower Granite Dam. In addition, nearly 3.17 million yearling spring Chinook are scheduled to be released to this zone over the next two weeks. Of these, about 51% are scheduled to be released into the Salmon River and 42% are scheduled to be released into the Clearwater River. The remaining 7% are scheduled

to be released into the Tucannon River. Nearly 2.27 million yearling summer Chinook are also scheduled for release into this zone over the next two weeks. All of these summer Chinook releases are scheduled to occur throughout the Salmon River Basin. Finally, just over 4.65 million summer steelhead are scheduled for release to this zone over the next two weeks. Of these, about 51% are scheduled for release into the Salmon River and its tributaries, 45% are scheduled for release into the Clearwater River and its tributaries, and 4% are scheduled for release into the Grande Ronde River.

Mid-Columbia Zone: The Mid-Columbia Zone encompasses the area of the Columbia River and its tributaries from McNary Dam to Chief Joseph Dam. Approximately 85,000 summer steelhead were scheduled to be released from the Dayton Acclimation Ponds on the Touchet River this week. This steelhead release was scheduled to begin on or around March 25th and is expected to run through mid-April. This was the only new release that was scheduled to occur in this zone this week.

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 280,000 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 Walla Walla River (100,000).

Lower Columbia Zone: The Lower Columbia Zone is defined as the Columbia River and its tributaries from Bonneville Dam to McNary Dam. Approximately 265,000 yearling fall Chinook were scheduled to be released into the Umatilla River this week. In addition, about 25,000 yearling spring Chinook juveniles were scheduled to be released into the Deschutes River this week.

Approximately 6.0 million subyearling fall Chinook tules are scheduled for release from Spring Creek National Fish Hatchery on or around April 5th. In

addition, several releases of yearling spring Chinook are scheduled for this zone over the next two weeks. In all, these spring Chinook releases are expected to total nearly 1.1 million juveniles. Of these, approximately 81% are scheduled to be released from acclimation facilities on the Umatilla River. Approximately 12% are scheduled to be released from Warm Springs National Fish Hatchery into the Deschutes River. The remaining 7% are scheduled to be released into Hood River. Finally, about 162,000 summer steelhead juveniles are scheduled for release 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 3/23/2016), 77 adult Chinook and 2,356 adult steelhead were counted. In 2015 for the same time frame, 536 adult Chinook and 2,776 adult steelhead were counted. The 2016 Bonneville Dam winter season count of adult Chinook had 459 fewer fish than the 2015 count. The 2016 adult steelhead count had 420 fewer fish than the 2015 winter count.

The Willamette Falls cumulative steelhead count from January 1st through March 23rd is 4,044. The 2016 Willamette Falls winter steelhead count was 1.3 times greater than the 2015 count of 3,141, while having 637 more fish than the 10-year average count of 3,407. This year's Lower Granite steelhead count of 2,561 is 51% of the 2015 count of 5,016 and has 492 fewer fish than the 10-year average count of 3,053.

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 24th, a total of 69 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: 3/12/2016 to 03/25/16

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	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	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					6,000,091				
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				
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	CH1	SP	2016	1,470,000	03-23-16	03-24-16	Dworshak Hatchery	Clearwater River M F
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					2,070,000				
Umatilla Tribe	Bonneville Hatchery	CH1	FA	2016	265,000	03-22-16	03-22-16	Pendelton Acclim Pond	Umatilla River
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					515,000				
Washington Dept. of Fish and Wildlif	Lyons Ferry Hatchery	ST	SU	2016	85,000	03-25-16	04-15-16	Dayton Acclim Pond	Touchet River
Washington Dept. of Fish and Wildlif	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 Wildlif	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					2,789,900				
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	Prosser Acclim. Pond	CH0	FA	2016	362,472	03-15-16	03-15-16	Prosser Acclim Pond	Yakima River
Yakama Tribe Total					1,022,472				
Grand Total					14,472,177				

Hatchery Releases Last Two Weeks

Hatchery Release Summary

From: 3/26/2016 to 4/8/2016

Agency	Hatchery	Species	Race	MigYr	NumRel	RelStart	RelEnd	RelSite	RelRiver
Idaho Dept. of Fish and Game	Clearwater Hatchery	CH1	SP	2016	474,513	04-04-16	04-05-16	N Fk Clearwater River	Clearwater River M F
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	McCall Hatchery	CH1	SU	2016	154,869	04-04-16	04-08-16	Knox Bridge	Salmon River (ID)
Idaho Dept. of Fish and Game	McCall Hatchery	CH1	SU	2016	875,460	04-04-16	04-08-16	Knox Bridge	Salmon River (ID)
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	Niagara Springs	ST	SU	2016	820,000	04-02-16	04-21-16	Pahsimeroi River	Pahsimeroi 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					7,335,970				
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	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	185,260	04-04-16	04-07-16	Nez Perce Tribal Hatchery	Clearwater River M F
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					857,749				
Oregon Dept. of Fish and Wildlife	Round Butte Hatchery	ST	SU	2016	162,000	04-08-16	04-08-16	Deschutes River	Deschutes River
Oregon Dept. of Fish and Wildlife	Umatilla Hatchery	CH1	SP	2016	165,000	04-07-16	04-07-16	Corporation Guard Station	Umatilla River
Oregon Dept. of Fish and Wildlife Total					327,000				
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	Hagerman NFH	ST	SU	2016	1,404,000	04-06-16	04-30-16	S Fk Salmon River	Salmon River (ID)
U.S. Fish and Wildlife Service	Spring Creek NFH	CH0	FA	2016	6,000,000	04-05-16	04-05-16	Spring Creek Hatchery	L Col R (D/s McN Dam)
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					9,566,000				
Umatilla Tribe	Carson NFH	CH1	SP	2016	250,000	03-31-16	03-31-16	Walla Walla River	Walla Walla River
Umatilla Tribe	Umatilla Hatchery	CH1	SP	2016	240,000	04-07-16	04-07-16	Thornhollow Acclim Pond	Umatilla River
Umatilla Tribe	Umatilla Hatchery	CH1	SP	2016	480,000	04-07-16	04-07-16	Imeques Acclim Pond	Umatilla River
Umatilla Tribe Total					970,000				
Warm Springs Tribe	Round Butte Hatchery	CH1	SP	2016	37,500	04-08-16	04-08-16	W Fk Hood River	Hood River
Warm Springs Tribe	Round Butte Hatchery	CH1	SP	2017	37,500	04-08-16	04-08-16	W Fk Hood River	Hood River
Warm Springs Tribe Total					75,000				
Washington Dept. of Fish & Wildlife	Lyons Ferry Hatchery	CH1	FA	2016	487,000	04-04-16	04-06-16	Lyons Ferry Hatchery	Snake River
Washington Dept. of Fish & Wildlife	Lyons Ferry Hatchery	ST	SU	2016	100,000	04-07-16	04-15-16	Walla Walla River	Walla Walla River
Washington Dept. of Fish & 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 & Wildlife	Methow Hatchery	ST	SU	2016	36,900	03-01-16	03-31-16	Twisp Acclim Pond	Methow River
Washington Dept. of Fish & 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 & Wildlife	Tucannon Hatchery	CH1	SP	2016	220,000	04-01-16	04-15-16	Curl Lake Acclim Pond	Tucannon River
Washington Dept. of Fish & 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					3,728,800				
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					23,590,299				

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
03/11/2016	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
03/18/2016	107.6	0.0	107.3	0.0	113.7	0.0	109.2	0.0	120.2	1.1	134.8	0.1	133.8	0.0
03/19/2016	98.5	0.0	98.9	0.0	104.2	0.0	102.1	0.0	111.4	0.0	118.8	0.0	115.6	0.0
03/20/2016	99.3	0.0	98.1	0.0	104.0	0.0	102.4	0.0	111.6	0.0	118.5	0.0	115.5	0.0
03/21/2016	93.7	0.0	95.0	0.0	99.8	0.0	99.9	0.0	108.6	2.0	119.2	0.0	116.0	0.0
03/22/2016	86.6	0.0	89.7	0.0	94.5	0.0	88.7	0.0	94.3	0.4	97.4	0.0	101.3	0.0
03/23/2016	110.5	0.0	112.7	0.0	111.7	0.0	105.8	0.0	113.4	0.0	113.0	0.0	113.7	0.0
03/24/2016	85.9	0.0	88.4	0.0	97.4	0.0	99.9	0.0	110.5	0.0	113.2	0.0	105.4	0.0

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

Date	Dworshak		Brownlee Inflow	Hells Canyon Outflow	Lower Granite		Little Goose		Lower Monumental		Ice Harbor	
	Flow	Spill			Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
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
03/18/2016	8.0	3.6	---	24.7	61.5	0.0	57.3	0.0	60.3	0.0	58.1	0.0
03/19/2016	8.0	3.6	---	25.4	57.1	0.0	57.0	0.0	57.7	0.0	57.9	0.0
03/20/2016	8.0	3.6	---	25.6	57.1	0.0	57.1	0.0	57.7	0.0	57.9	0.0
03/21/2016	8.0	3.6	---	25.5	56.6	0.0	56.3	0.0	59.4	0.0	58.8	0.0
03/22/2016	8.1	3.7	---	21.7	61.9	0.0	58.6	0.0	60.5	0.0	60.4	0.0
03/23/2016	10.0	0.1	---	21.0	71.2	0.0	67.5	0.0	71.2	0.0	68.3	2.9
03/24/2016	9.9	0.0	---	---	72.4	0.0	67.7	0.0	72.8	0.0	75.1	2.0

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		
03/11/2016	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
03/18/2016	192.9	0.0	198.7	0.0	201.0	0.0	217.6	1.2	72.3	131.7
03/19/2016	186.6	0.0	194.9	0.0	196.2	0.0	215.0	1.2	82.2	119.2
03/20/2016	172.4	0.0	183.8	0.0	187.8	0.0	201.4	1.2	83.1	104.7
03/21/2016	182.1	0.0	190.9	0.0	190.5	0.0	203.4	1.2	81.6	108.1
03/22/2016	179.8	0.0	185.6	0.0	184.9	0.0	210.6	1.2	88.2	108.8
03/23/2016	187.0	2.9	192.8	0.0	196.4	0.0	208.7	1.2	82.2	112.9
03/24/2016	192.9	0.0	187.7	0.0	189.6	0.0	212.1	1.2	79.7	118.8

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>
3/11	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	24	---	---	---	0	101.3	101.5	101.9	24	100.7	101.1	101.7	24	100.2	100.4	100.6	24
3/18	97.7	98.1	98.8	24	---	---	---	0	101.6	102.1	102.3	24	101.3	101.8	102.0	24	100.6	101.0	101.1	24
3/19	96.3	96.9	97.5	24	---	---	---	0	102.3	102.9	103.3	24	102.0	102.5	103.1	24	101.4	101.8	101.9	24
3/20	96.0	96.6	96.8	24	---	---	---	0	103.8	104.6	105.3	24	102.8	103.3	103.6	24	102.5	102.9	103.0	24
3/21	96.8	97.0	97.3	24	---	---	---	0	104.7	104.9	105.1	24	103.5	103.8	104.3	24	103.3	103.7	103.9	24
3/22	96.6	96.8	96.9	24	---	---	---	0	103.9	104.5	104.7	24	103.5	103.8	104.3	24	103.4	103.6	103.7	24
3/23	95.9	96.0	96.2	24	---	---	---	0	103.0	103.5	103.7	24	102.2	102.5	102.7	24	102.5	102.6	103.0	24
3/24	96.4	96.6	96.9	23	---	---	---	0	103.5	103.7	104.5	23	103.0	103.6	104.0	23	103.2	103.3	103.4	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>
3/11	---	---	---	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	24	102.7	104.3	113.9	24
3/18	---	---	---	0	100.7	100.7	101.1	10	101.2	101.2	101.6	10	100.7	100.9	101.2	24	101.5	101.7	102.1	24
3/19	---	---	---	0	101.1	101.6	102.0	24	101.4	102.1	102.7	24	102.6	103.0	103.3	24	103.4	103.8	104.1	24
3/20	---	---	---	0	102.3	102.8	103.0	24	102.6	103.1	103.3	24	102.7	102.9	103.0	24	103.4	103.6	103.7	24
3/21	---	---	---	0	102.7	103.2	103.4	24	103.0	103.5	103.8	24	103.2	103.6	103.8	24	103.9	104.2	104.4	24
3/22	---	---	---	0	102.9	103.2	103.5	24	103.3	103.6	103.9	24	103.1	103.3	103.5	24	103.7	104.1	104.6	24
3/23	---	---	---	0	102.2	102.5	102.7	24	102.5	102.8	103.0	24	102.4	102.7	103.0	24	103.0	103.3	103.5	24
3/24	---	---	---	0	102.6	102.8	103.0	23	102.9	103.1	103.5	23	103.0	103.1	103.2	23	103.5	103.6	103.6	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>
3/11	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	101.4	101.8	102.1	24	100.9	101.6	104.1	24	101.3	101.7	102.0	24
3/17	100.6	101.5	104.9	24	100.9	101.8	105.0	24	101.1	101.3	101.7	24	101.4	102.8	104.9	24	101.1	101.3	101.7	24
3/18	100.7	101.3	103.3	24	101.4	102.1	104.8	24	102.1	102.6	102.8	24	101.7	101.8	102.2	24	101.6	102.1	102.3	24
3/19	102.1	103.7	104.3	24	102.2	103.6	104.4	24	102.3	102.6	102.8	24	101.8	102.2	102.4	24	102.3	102.7	102.8	24
3/20	102.6	102.9	103.5	24	103.0	103.3	104.0	24	103.3	103.5	103.6	24	103.3	103.6	103.8	24	103.0	103.3	103.4	24
3/21	102.7	103.2	103.5	24	103.3	104.0	107.0	24	103.6	103.9	104.1	24	103.5	103.9	104.1	24	103.5	103.8	104.0	24
3/22	101.9	102.9	103.5	24	103.0	103.4	104.4	24	103.4	103.9	104.3	24	103.4	103.9	104.2	24	102.7	103.1	103.5	24
3/23	102.1	102.4	102.8	24	102.3	102.6	102.9	24	102.4	102.8	103.1	24	102.2	102.4	102.7	24	102.1	102.5	102.8	24
3/24	102.5	102.6	102.8	23	102.7	102.9	103.1	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		24 h Avg	12 h Avg	High		24 h Avg	12 h Avg	High		24 h Avg	12 h Avg	High		24 h Avg	12 h Avg	High	
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	101.4	102.1	103.5	24	---	---	---	0	103.8	104.1	104.5	24	101.6	102.2	102.7	24	101.9	102.0	102.5	15
3/17	100.8	101.8	103.8	24	---	---	---	0	103.2	104.5	105.7	24	101.3	101.9	102.4	24	101.6	102.0	102.6	24
3/18	101.5	102.3	102.5	24	---	---	---	0	105.9	106.2	106.6	24	102.5	103.3	104.1	24	101.7	102.5	103.0	24
3/19	101.8	102.1	102.3	24	---	---	---	0	106.3	106.7	107.1	24	102.9	103.9	104.6	24	102.1	102.8	103.6	24
3/20	102.4	102.7	103.0	24	---	---	---	0	106.9	107.4	107.7	24	103.4	104.2	104.9	24	102.5	103.1	103.7	24
3/21	103.1	103.5	103.7	24	---	---	---	0	107.2	107.4	107.8	24	103.4	104.0	104.9	24	102.5	103.1	104.0	24
3/22	102.3	102.6	102.8	24	---	---	---	0	106.7	107.0	107.2	24	101.8	102.1	103.0	24	101.4	101.8	102.2	24
3/23	101.7	102.2	102.6	24	---	---	---	0	94.7	95.0	98.0	24	98.9	99.4	101.2	24	101.6	102.5	102.9	24
3/24	---	---	---	0	---	---	---	0	94.9	95.1	95.2	23	99.0	99.2	99.3	23	102.0	102.3	102.8	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		24 h Avg	12 h Avg	High		24 h Avg	12 h Avg	High		24 h Avg	12 h Avg	High		24 h Avg	12 h Avg	High	
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	22	99.6	99.8	99.9	24	99.2	99.3	99.8	24	99.2	99.5	100.3	24	98.5	98.7	98.9	24
3/18	101.0	102.2	102.6	24	100.5	101.1	101.4	24	99.9	100.4	100.7	24	99.3	99.7	99.8	24	99.1	99.5	99.9	24
3/19	102.6	103.6	104.1	24	101.8	102.3	103.0	24	101.1	101.6	102.0	24	99.8	100.1	100.5	24	99.5	99.9	100.1	24
3/20	103.1	104.0	104.4	24	103.0	103.4	103.6	24	102.4	102.7	102.9	24	101.1	101.6	102.1	24	100.2	100.5	100.8	24
3/21	103.2	104.1	104.5	24	103.5	103.9	104.2	24	103.0	103.2	103.6	24	101.0	101.2	101.3	24	100.6	101.1	101.4	24
3/22	101.5	102.1	103.0	24	103.2	103.6	104.0	24	102.5	102.9	103.3	24	100.9	101.3	101.8	24	100.3	100.5	100.7	24
3/23	100.4	100.7	100.9	24	101.9	102.2	102.5	24	101.4	101.6	101.7	24	100.5	101.0	101.4	24	100.2	100.8	101.5	24
3/24	100.9	101.0	101.1	23	101.8	102.1	102.3	23	101.4	101.7	102.2	23	101.4	101.5	101.6	23	100.8	100.9	101.0	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		24 h Avg	12 h Avg	High		24 h Avg	12 h Avg	High		24 h Avg	12 h Avg	High		24 h Avg	12 h Avg	High	
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	24	99.2	99.3	99.4	24	---	---	---	0	100.2	100.8	101.0	24	---	---	---	0
3/18	99.7	99.8	100.0	24	99.3	99.6	99.9	24	---	---	---	0	100.9	101.2	101.5	24	---	---	---	0
3/19	100.1	100.3	100.5	24	99.7	100.0	100.2	24	---	---	---	0	100.7	101.0	101.3	24	---	---	---	0
3/20	101.0	101.1	101.4	24	100.6	100.7	100.9	24	---	---	---	0	101.1	101.4	101.7	24	---	---	---	0
3/21	101.6	101.9	102.1	24	101.0	101.3	101.4	24	102.0	102.1	102.3	14	101.4	101.8	102.1	24	---	---	---	0
3/22	101.1	101.5	101.9	24	100.5	100.9	101.2	24	101.2	101.6	102.0	24	100.9	101.2	101.4	24	---	---	---	0
3/23	100.0	100.3	100.5	24	99.6	99.8	100.1	24	100.3	100.6	100.9	24	100.7	101.8	103.6	24	---	---	---	0
3/24	100.5	100.6	100.8	23	100.2	100.3	100.6	23	100.7	100.8	100.9	23	101.2	102.0	103.6	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>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24h</u>	<u>12h</u>		<u>#</u>	<u>24h</u>	<u>12h</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>				
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	101.3	101.6	101.7	24	100.5	100.8	101.1	24	100.4	100.8	101.2	24	100.5	100.6	100.7	24
3/18	---	---	---	0	102.5	103.0	103.5	24	101.0	101.3	101.5	24	100.7	101.0	101.1	24	100.6	100.7	100.8	24
3/19	---	---	---	0	103.8	104.0	104.1	24	101.5	101.8	102.1	24	101.2	101.6	101.9	24	101.1	101.4	101.6	24
3/20	---	---	---	0	104.3	104.5	104.7	24	102.2	102.3	102.4	24	102.1	102.4	102.7	24	101.9	102.0	102.1	24
3/21	---	---	---	0	104.5	105.0	105.3	24	102.6	102.9	103.1	24	102.6	102.9	103.2	24	102.0	102.3	102.5	24
3/22	103.4	103.6	103.8	15	103.8	104.2	104.5	24	102.2	102.4	102.8	24	102.1	102.4	102.8	24	101.4	101.7	102.0	24
3/23	102.2	102.4	102.7	24	103.8	105.5	114.3	24	101.6	101.9	102.2	24	101.6	102.0	102.5	24	101.3	101.6	102.0	24
3/24	102.1	102.3	102.5	23	102.1	102.3	102.6	23	102.3	102.4	102.5	23	102.3	102.4	102.5	23	101.8	101.9	102.2	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>#</u>	<u>24 h</u>	<u>12 h</u>		<u>#</u>	<u>24h</u>	<u>12h</u>		<u>#</u>	<u>24h</u>	<u>12h</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>				
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	24	101.5	101.8	102.0	24	102.2	102.4	102.6	24	102.5	102.9	103.5	24	106.2	107.1	107.4	24
3/18	100.0	100.1	100.3	24	101.6	101.8	102.0	24	102.4	102.6	102.7	24	101.7	102.1	102.6	24	106.1	106.8	107.3	24
3/19	100.3	100.7	100.8	24	102.0	102.4	102.8	24	102.7	103.2	103.4	24	102.4	103.2	103.8	24	106.4	107.2	107.6	24
3/20	101.2	101.4	101.5	24	102.5	102.6	102.6	24	103.5	103.7	104.0	24	103.0	103.3	103.6	24	107.3	107.7	107.8	24
3/21	101.2	101.4	101.8	24	102.7	102.8	102.9	24	103.6	103.8	104.0	24	103.2	103.4	103.7	24	107.1	107.8	107.9	24
3/22	100.7	100.8	101.0	24	101.6	102.0	102.6	24	102.5	102.8	103.3	24	102.3	102.7	102.9	24	106.3	106.8	107.1	24
3/23	100.6	100.9	101.1	24	101.2	101.6	102.1	24	102.2	102.6	103.1	24	102.0	102.5	102.9	24	106.0	106.8	107.3	24
3/24	101.1	101.1	101.2	23	101.7	101.8	102.0	23	102.4	102.6	102.9	23	102.2	102.4	102.7	23	106.2	106.8	107.2	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: 03/24

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	03/23	77	3	536	3	107	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	03/22	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LGR	03/21	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	03/23	6	0	54	0	14	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.		10-Yr			2016		2015		10-Yr		2016		2015		10-Yr	
		Adult	Jack	Adult	Jack	Adult	Jack	2016	2015	Avg.	2016	2015	Avg.	2016	2015	Avg.	2016	2015	Avg.	2016	2015	Avg.
BON	03/23	0	0	0	0	0	0	1	1	0	2356	2776	1916	1021	1479	606	-1	0	0	0	0	0
TDA		0	0	0	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	0	0	0
MCN		0	0	0	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	0	0	0
LMN		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LGS	03/22	0	0	0	0	0	0	0	0	0	1495	0	0	754	0	0	0	0	0	0	0	0
LGR	03/21	0	0	0	0	0	0	0	0	0	2561	5016	3053	1188	1930	862	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	0	0	0
WAN		0	0	0	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	0	0	0
RRH		0	0	0	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	0	0	0
WFA	03/23	0	0	1	0	0	0	0	0	0	4044	3141	3407	0	0	0	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.