



*Fish Passage Center*

# Weekly Report #99 - 1

March 12, 1999

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**PLEASE NOTE:**

The Fish Passage Center 1998 Draft Annual Report is available on our website at [www.fpc.org](http://www.fpc.org). If you would like a copy and do not have access to the internet, please call us for a copy.

Also, the Fish Passage Center Weekly Report is available on Friday of each week by 4:00 p.m. on our internet homepage at [www.fpc.org](http://www.fpc.org). If you can get the information from the website, you will get your information sooner and help us utilize our resources more efficiently by saving postage and paper costs. Reduced use of paper also helps the environment. Please let us know if you want to be taken off the weekly report mailing list. You can email us at [fpcstaff@fpc.org](mailto:fpcstaff@fpc.org). Thanks!

**SUMMARY OF EVENTS:**

**Water Supply:** Wet conditions prevailed over the whole basin through February. The October-February total for the Columbia River above The Dalles is 123%.

The March 1, January-July forecast for the Columbia River above The Dalles is 130 MAF, or 123% of average. This is an increase of 10% from last month and compares to a runoff of 104.1 MAF in 1998. The Summary of the Runoff Volume Forecast shows that this year will be above average water year with most sites' runoff in the range of 106-150%. Runoff Volume Forecasts show increases for all major sites during January-March period. The summary of the Runoff Volume for different sites through January-March period is given in the following Table.

Location	Period	Jan. 99 Final		Feb. 99 Final		March 99 Final	
		MAF	%	MAF	%	MAF	%
Libby	Apr-Sep	6.91	102	7.33	108	7.53	111
Hungry Horse	Apr-Sep	2.33	107	2.4	110	2.48	114
Grand Coulee	Jan-Jul	68.7	109	71.4	113	74.1	117
The Dalles	Jan-Jul	116.0	110	119.0	112	130	123
Lower Granite	Jan-Jul	32.7	110	32.8	110	37.9	127
Dworshak	Apr-Jul	3.1	115	3.1	115	3.6	133
Brownlee	Apr-Jul	5.73	99	5.93	102	8.38	145

**System Storage and Streamflow:** The system is being operated for flood control purposes. Hungry Horse has been drafted below the end of March flood control elevation for maintenance work. The COE is operating Libby at minimum outflow in order to refill the reservoir to an end of April flood control elevation. Summary of the current elevations and end of March flood control elevations is given in the following Table:

Reservoir	Actual elevation as of March 10 [ft]	Max Reservoir pool [ft]	End of March Flood Control Elevation [ft]
Libby	2322.28	2459	2310.9
Hungry Horse	3498.5	3560	3507.1
Grand Coulee	1257.6	1290	1247.7
Brownlee	2041.3*	2077	2006.8
Dworshak	1477.1	1600	1445.0

\*as of March 9

**Upper Snake reservoirs:**

Currently all reservoirs are operating for flood control, drafting reservoirs during March and passing inflow during April. American Falls Reservoir is projected to be 83% full by the end of March and limiting draft to 20 KAF during April. Flows at Milner are currently about 8 kcfs. Projected flows at Milner in April are in the range of 8-15 kcfs.

The anticipated spring flow target based on the March Final Runoff Volume Forecast is: at Lower Granite 100 kcfs; and at McNary 260 kcfs. The latest SSARR is projecting that seasonal spring flow targets at both projects will be met during the entire spring season. The average discharge for the major run-of-river projects for March 4-10, are given in the following Table:

Project	Average Discharge [kcfs], March 4-10
Priest Rapids	153.0
McNary	239.1
Lower Granite	76.9
Bonneville	262.3

The Fishery agencies request to meet a flow target of 125 kcfs below Bonneville dam during the entire fall season has been met. Flows were requested to protect natural spawning and emergence of the fall chinook below Bonneville Dam.

**Spill:** Approximately 4.2 million tule fall chinook are scheduled for release from the Spring Creek Hatchery on the morning of March 18, 1999. The fishery agencies and tribes have submitted SOR #99-1 requesting spill to begin on March 18, 1999 at 2000 hours and to extend for a ten-day period. Spill is requested to occur 24-hours a day, up to levels that reach the 120% total dissolved gas cap at the Warrendale dissolved gas monitor. Total dissolved gas waivers were requested and received from the State of Oregon Department of Environmental Quality and the Washington Department of Ecology. A response to the SOR has not been received as of this writing.

Spill is presently occurring at Dworshak Dam as that project has increased outflow in order to achieve its flood control elevation. Spill is also occurring at the Hells Canyon complex for the same reasons. Some excess capacity spill has occurred in the Lower Columbia at McNary and Bonneville dams over the past week.

**Smolt Monitoring.** The 1999 smolt monitoring season is about to get underway. The operation of traps on the Salmon, Snake, and Grande Ronde rivers is scheduled to begin March 14 with the first sample taken March 15. However, we are still awaiting a signed ESA permit, so the actual operation of these traps may be delayed further into next week. The Nez Perce Tribe samplers at the Imnaha River trap are scheduled to begin sending us data the week of March 14 depending on the status of their ESA permit. Sampling at the Bonneville Dam Powerhouse 1 trap was scheduled to begin March 8, but has been delayed pending receipt of our ESA permit. Sampling at Lower Granite and McNary dams is scheduled to begin March 25 or shortly thereafter depending on water-up of the bypass systems. Monitoring at Little Goose, Lower Monumental, Rock Island, and John Day dams is scheduled to begin April 1.

**Adult Fish Passage:** Lower Granite Dam began reporting adult fish counts on March 1. To date, only steelhead have been counted. Bonneville Dam will start reporting adult counts on March 15 with the rest of the COE projects beginning their counting for the 1999 adult fish migration on April 1. The Public Utility Districts normally initiate counting near April 15 at Grant and Chelan PUD projects with Douglas PUD initiating counting at Wells Dam on May 1.

As in past seasons, the FPC Weekly Report will incorporate a Table with the current 1999 adult count, the 1998 count, and the 10-year average by species for Columbia and Snake River dams where adult fish counting is conducted. Note that the 1998 and 10-year average will be reported through the same ending date as the 1999 count, e.g., an ending date of March 11 would list the 1999 count through 3/11, the 1998 count through 3/11/98, and the 10-year average (1989-1998) through 3/11 for the 10 years.

The adult spring chinook estimates for the 1999 migration are projecting reduced numbers returning to most river systems above Bonneville Dam. This is not entirely a surprise as numbers of juvenile spring chinook migrating to the ocean

in 1997 were extremely low from most hatcheries as well as from "wild" outmigrants. Bonneville Dam will give the first indication of returning adult chinook numbers, and as noted above, the fish counting will begin next week.

**Hatchery Releases:** At present, 1999 hatchery release schedules from the various fishery agencies and tribes are being compiled and updated. Releases of fish were made in each section of the Columbia River basin. The data will include hatchery releases during the past two weeks and for the upcoming two weeks. The schedules will be changed as they are received from the coordinators or hatcheries.

**Lower Columbia River (above Bonneville Dam to McNary Dam)** – Klickitat Hatchery released their normal production of yearling spring chinook (about 530,000 Brood Year 1997) in early March. Warm Springs NFH released 750,000 yearling spring chinook on March 4 due to a gasoline spill that occurred above the hatchery. A Systems Operation Request was submitted put together by the fish agencies and tribes to operate the sluiceway at The Dalles Dam and offer further protection for those fish when they arrive at the project. Normally the sluiceway is operated starting on April 1<sup>st</sup>. Yearling spring chinook were also released in the Umatilla River on March 8<sup>th</sup> with the yearling fall chinook from Thornhollow Acclimation Pond released on March 11<sup>th</sup>. The large release of about 4.2 million subyearling "tule" fall chinook is scheduled for March 18. This release is normally the largest single-point day release of fish above Bonneville Dam. A SOR has been submitted to give special protection for these fish at Bonneville Dam.

**Mid-Columbia River** – At Ringold Hatchery, a portion of their yearling spring chinook production was released to reduce density in the pond. An estimated 360,000 were released between 2/27 and 3/1. The remaining yearling spring chinook is tentatively scheduled for April.

**Snake River** – A number of hatcheries released spring chinook in the late fall 1998, but they will be expected to migrate in spring 1999. Most releases of yearling spring chinook will

occur from late March through mid-April. Some hatcheries are still waiting for Permits prior to releasing their fish.

**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
02/26/99	99.7	0.0	103.4	0.0	108.8	0.0	121.0	0.0	119.9	0.0	120.3	0.0	122.3	0.0
02/27/99	90.3	0.0	88.2	0.0	89.9	0.0	93.7	0.0	89.6	0.0	90.2	0.0	92.5	0.0
02/28/99	55.8	0.0	60.7	0.0	64.8	0.0	73.1	0.0	69.4	0.0	74.3	0.0	76.1	0.0
03/01/99	126.4	0.0	122.9	0.0	121.7	0.0	122.6	2.0	115.9	0.0	117.5	0.0	118.3	0.0
03/02/99	120.4	0.0	122.7	0.0	125.3	0.0	134.7	0.5	135.5	0.0	138.8	0.0	145.4	3.6
03/03/99	136.9	0.0	138.2	0.0	135.4	0.0	132.8	1.6	130.9	0.0	138.5	0.0	143.3	0.0
03/04/99	149.0	0.0	150.4	0.0	151.5	0.0	159.9	16.8	158.5	0.0	153.4	0.0	157.7	0.0
03/05/99	133.1	0.0	134.6	0.0	134.5	0.0	142.7	1.9	144.6	0.0	153.7	0.0	159.4	0.0
03/06/99	138.8	0.0	138.0	0.0	137.5	0.0	140.3	0.0	141.1	0.0	146.2	0.0	150.1	0.0
03/07/99	126.4	0.0	129.0	0.0	133.9	0.0	141.7	3.1	140.4	0.0	138.4	0.0	143.4	0.0
03/08/99	159.1	0.1	158.4	0.0	154.1	0.0	152.2	10.2	151.2	0.0	148.6	0.0	150.0	0.0
03/09/99	154.1	0.0	153.3	0.0	155.2	2.9	161.8	19.3	161.5	0.0	148.2	0.3	151.3	0.0
03/10/99	130.7	0.0	141.8	0.0	145.4	0.0	150.9	14.5	150.4	0.0	161.5	2.4	159.3	0.0
03/11/99	134.1	0.0	134.7	0.0	137.3	0.0	142.8	4.7	142.5	0.0	147.6	0.0	156.5	0.0

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

Date	Dworshak		Brownlee		Lower Granite		Little Goose		Lower Monumental		Ice Harbor	
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
02/26/99	10.6	0.0	---	---	75.8	0.0	73.6	0.0	87.5	0.0	84.8	30.8
02/27/99	10.6	0.0	---	---	77.9	0.0	79.6	0.0	89.8	0.0	90.6	29.9
02/28/99	10.6	0.0	---	---	80.6	0.0	81.5	0.0	92.0	0.0	91.8	32.6
03/01/99	10.6	0.0	---	---	95.3	0.0	92.1	0.0	105.1	0.0	110.0	52.5
03/02/99	10.6	0.0	---	---	93.4	0.0	98.1	0.0	113.6	0.0	111.5	48.8
03/03/99	10.6	0.0	---	---	88.2	0.0	86.9	0.0	92.4	0.0	91.5	23.0
03/04/99	14.2	3.6	---	---	86.5	0.0	86.9	0.0	99.5	0.7	100.2	22.1
03/05/99	14.2	3.6	---	---	81.2	0.0	80.8	0.0	84.2	0.0	81.3	0.6
03/06/99	14.1	3.5	---	---	77.0	0.0	73.6	0.0	78.9	0.0	79.0	0.0
03/07/99	14.1	3.5	---	---	72.2	0.0	70.1	0.0	77.2	0.0	80.1	0.0
03/08/99	14.1	3.5	---	---	71.9	0.1	73.3	0.0	78.3	0.0	74.3	0.0
03/09/99	14.3	3.5	---	---	73.7	0.0	75.4	0.0	81.9	0.0	78.9	0.0
03/10/99	14.2	3.4	---	---	75.5	0.0	81.1	0.0	84.7	0.0	82.2	0.0
03/11/99	14.0	3.4	---	---	71.3	0.0	65.0	0.0	71.4	0.0	70.3	0.9

**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		
02/26/99	218.9	21.5	229.3	0.0	233.5	0.0	263.4	0.0	97.8	156.8
02/27/99	208.3	4.9	234.7	0.0	235.7	0.0	264.5	0.0	100.9	154.8
02/28/99	188.2	0.0	217.9	0.0	216.1	0.0	260.5	0.0	95.3	156.4
03/01/99	182.0	1.3	190.1	0.0	197.1	0.0	226.0	0.0	84.2	133.0
03/02/99	266.3	61.2	250.5	0.0	239.5	9.0	252.0	0.0	88.9	154.3
03/03/99	229.6	20.2	249.9	3.8	259.0	3.0	269.5	2.6	100.3	157.8
03/04/99	254.2	42.2	264.7	14.5	258.9	2.0	275.0	12.1	96.8	157.2
03/05/99	269.5	55.5	287.5	11.6	284.9	9.0	294.2	32.3	86.8	166.3
03/06/99	239.3	20.9	249.6	0.0	253.4	0.0	271.0	13.2	86.4	162.6
03/07/99	218.4	0.0	233.9	0.0	238.8	0.0	263.7	0.0	92.0	162.9
03/08/99	214.0	0.0	231.3	0.0	230.4	0.0	231.1	0.0	72.0	150.3
03/09/99	223.3	13.2	222.3	0.0	224.9	0.0	225.2	2.6	69.0	144.7
03/10/99	255.1	40.6	256.0	0.0	257.0	0.0	278.6	30.5	82.6	156.7
03/11/99	230.8	14.2	260.0	0.0	256.8	0.0	286.1	23.7	90.8	162.8

# Hatchery Release Summary

Schedule for last two weeks

From 2/26/99 to 3/11/99

Hatchery	Species...	Migration Year	Number		...Release Dates...		Release Site	River Name
			Released		Begin...	...End		
<b>Umatilla Tribe</b>								
<b>Imeques</b>								
	SP	Chinook	1999	255,000	03/08/99	03/08/99	Imeques Acclim Pd	Umatilla River
	SP	Chinook	1999	175,000	03/08/99	03/08/99	Imeques Acclim Pd	Umatilla River
<b>Thornhollow</b>								
	FA	Chinook	1999	240,000	03/11/99	03/11/99	Thornhollow Acclim Pd	Umatilla River
	<b>Agency Totals:</b>			<b>670,000</b>	.....			
<b>USFWS</b>								
<b>Warm Springs</b>								
	SP	Chinook	1999	30,000	10/01/98	03/04/99	Warm Springs H	Deschutes River
	SP	Chinook	1999	750,000	03/04/99	03/04/99	Warm Springs H	Deschutes River
	<b>Agency Totals:</b>			<b>780,000</b>	.....			
<b>Washington</b>								
<b>Klickitat</b>								
	SP	Chinook	1999	530,000	03/01/99	03/03/99	Klickitat H	Klickitat River
<b>Ringold</b>								
	SP	Chinook	1999	360,000	02/27/99	03/01/99	Ringold Springs H	Mid-Columbia River
<b>Tucannon</b>								
	SP	Chinook	1999	25,000	03/09/99	04/20/99	Curl Lake	Tucannon River
	<b>Agency Totals:</b>			<b>915,000</b>	.....			
	<b>Total Release..</b>			<b>2,365,000</b>				

# Hatchery Release Summary

Schedule for next two weeks

From 3/12/99 to 3/25/99

Hatchery	Species...	Migration Year	Number Released	...Release Dates... Begin... ..End	Release Site	River Name
<b>Idaho</b>						
<b>Niagara Springs</b>						
	SU Steelhead	1999	660,000	03/25/99 04/10/99	Hells Canyon Dam	Snake River
<b>Pahsimeroi</b>						
	SU Chinook	1999	125,000	03/20/99 04/15/99	Pahsimeroi H	Pahsimeroi River
<b>Rapid River</b>						
	SP Chinook	1999	3,045,000	03/16/99 04/15/99	Rapid River H	Little Salmon River
<b>Agency Totals:</b>			<b>3,830,000</b>	.....		
<b>Nez Perce</b>						
<b>Clearwater</b>						
	SP Chinook	1999	300,000	03/22/99 03/26/99	Selway R	Clearwater Rvr M F
<b>Lyons Ferry</b>						
	FA Chinook	1999	150,000	03/25/99 04/12/99	Cpt John Acclim Pd	Snake River
<b>Agency Totals:</b>			<b>450,000</b>	.....		
<b>Oregon</b>						
<b>Lower Herman C</b>						
	Coho	1999	500,000	03/20/99 03/31/99	Umatilla R	Columbia River
<b>Imnaha</b>						
	SP Chinook	1999	89,000	03/15/99 04/15/99	Imnaha Acclim Pd	Imnaha River
	SP Chinook	1999	106,500	03/15/99 04/15/99	Imnaha Acclim Pd	Imnaha River
<b>Agency Totals:</b>			<b>695,500</b>	.....		
<b>USFWS</b>						
<b>Dworshak</b>						
	SP Chinook	1999	1,000,000	03/22/99 04/09/99	Dworshak H	Clearwater Rvr M F
<b>Kooskia</b>						
	SP Chinook	1999	600,000	03/22/99 04/09/99	Kooskia H	Clearwater Rvr M F
<b>Spring Creek</b>						
	FA Chinook	1999	4,200,000	03/18/99 03/18/99	Spring Creek H	Columbia River
<b>Agency Totals:</b>			<b>5,800,000</b>	.....		
<b>Washington</b>						
<b>Lyons Ferry</b>						
	SU Steelhead	1999	250,000	03/25/99 04/30/99	Cottonwood Acclim Pd	Grande Ronde River
	FA Chinook	1999	450,000	03/25/99 04/12/99	Lyons Ferry H	Snake River
	SU Steelhead	1999	125,000	03/25/99 04/30/99	Dayton Acclim Pd	Walla Walla River
<b>Wells</b>						
	SU Chinook	1999	580,000	03/25/99 04/15/99	Similkameen Acclim Pd	Okanogan River
<b>Agency Totals:</b>			<b>1,405,000</b>	.....		
<b>Total Release..</b>			<b>12,180,50</b>			

## Total Dissolved Gas Saturation (%) - Average of 12 Highest Hours, 24 h Average and 24 h High<sup>2</sup>

### Total Dissolved Gas Saturation Data at Upper Columbia Sites

Date	<u>Can. Boundary</u>			<u>Grand Coulee</u>			<u>Tlwr G. Coulee</u>			<u>Chief Joseph</u>			<u>Wells</u>			<u>Rocky Reach</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>24 h</u>	<u>12 h</u>	<u>#</u>						
	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High						
2/26	104	105	107	24	102	102	102	23	101	101	102	23	---	---	---	0	---	---	---	0	---	---	---	0
2/27	103	103	103	24	102	103	103	23	101	102	102	23	---	---	---	0	---	---	---	0	---	---	---	0
2/28	103	104	104	24	103	103	103	23	102	103	106	23	---	---	---	0	---	---	---	0	---	---	---	0
3/1	103	103	104	24	102	102	102	23	100	101	103	23	---	---	---	0	---	---	---	0	---	---	---	0
3/2	103	104	105	24	102	103	104	23	101	102	102	23	---	---	---	0	---	---	---	0	---	---	---	0
3/3	104	105	105	24	104	104	104	23	102	102	105	23	---	---	---	0	---	---	---	0	---	---	---	0
3/4	103	103	104	24	103	103	103	23	100	101	101	23	---	---	---	0	---	---	---	0	---	---	---	0
3/5	102	103	103	24	102	102	102	23	100	100	101	23	---	---	---	0	---	---	---	0	---	---	---	0
3/6	103	103	104	24	102	102	103	23	101	101	102	23	---	---	---	0	---	---	---	0	---	---	---	0
3/7	103	104	104	24	103	103	103	23	101	102	102	23	---	---	---	0	---	---	---	0	---	---	---	0
3/8	103	103	104	23	103	104	104	23	102	102	103	23	---	---	---	0	---	---	---	0	---	---	---	0
3/9	103	104	104	24	103	104	104	23	102	102	102	23	---	---	---	0	---	---	---	0	---	---	---	0
3/10	102	103	103	24	102	102	103	23	101	101	102	23	---	---	---	0	---	---	---	0	---	---	---	0
3/11	102	103	104	24	102	102	103	23	101	101	102	23	---	---	---	0	---	---	---	0	---	---	---	0

### Total Dissolved Gas Saturation Data at Mid Columbia Sites

Date	<u>Tlwr. Rocky R.</u>			<u>Rock Island</u>			<u>Tlwr. Rock Island</u>			<u>Wanapum</u>			<u>Tlwr Wanapum</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>24 h</u>	<u>12 h</u>	<u>#</u>						
	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High						
2/26	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
2/27	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
2/28	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/1	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/2	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/3	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/4	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/5	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/6	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/7	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/8	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/9	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/10	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/11	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0

### Total Dissolved Gas Saturation at Mid Columbia, Clearwater and Snake Sites

Date	<u>Dwnstr P Rapids</u>			<u>Dworshak</u>			<u>Clearwater</u>			<u>Snake-Lewiston</u>			<u>Lower Granite</u>			<u>Tlwr L. Granite</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>24 h</u>	<u>12 h</u>	<u>#</u>						
	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High						
2/26	---	---	---	0	96	96	96	24	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
2/27	---	---	---	0	96	96	96	23	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
2/28	---	---	---	0	96	96	96	24	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/1	---	---	---	0	95	95	96	16	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/2	---	---	---	0	96	96	97	19	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/3	---	---	---	0	96	97	97	24	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/4	---	---	---	0	105	105	105	24	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/5	---	---	---	0	105	105	105	24	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/6	---	---	---	0	105	105	105	24	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/7	---	---	---	0	105	105	106	24	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/8	---	---	---	0	105	105	105	6	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/9	---	---	---	0	105	105	106	19	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/10	---	---	---	0	105	105	105	18	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/11	---	---	---	0	105	105	105	5	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0

## Total Dissolved Gas Saturation (%) - Average of 12 Highest Hours, 24 h Average and 24 h High<sup>2</sup>

### Total Dissolved Gas Saturation Data at Snake Sites

Date	<u>Little Goose</u>				<u>Tlwtr L. Goose</u>				<u>Lower Mon.</u>				<u>Tlwtr L. Mon</u>				<u>Ice Harbor</u>				<u>Tlwtr Ice Harbor</u>				
	<u>24 h</u>		<u>12 h</u>		#	<u>24 h</u>		<u>12 h</u>		#	<u>24 h</u>		<u>12 h</u>		#	<u>24 h</u>		<u>12 h</u>		#	<u>24 h</u>		<u>12 h</u>		#
	Avg	Avg	High	hr		Avg	Avg	High	hr		Avg	Avg	High	hr		Avg	Avg	High	hr		Avg	Avg	High	hr	
2/26	100	100	100	7	---	---	---	0	---	---	---	0	---	---	---	0	101	101	101	24	112	114	114	24	
2/27	101	101	101	24	---	---	---	0	---	---	---	0	---	---	---	0	102	102	102	24	113	114	114	24	
2/28	101	101	101	24	---	---	---	0	---	---	---	0	---	---	---	0	102	102	102	24	112	114	118	24	
3/1	100	101	101	24	---	---	---	0	---	---	---	0	---	---	---	0	101	101	102	24	115	116	117	24	
3/2	100	101	102	24	---	---	---	0	---	---	---	0	---	---	---	0	102	103	104	23	113	114	115	23	
3/3	101	102	102	24	---	---	---	0	---	---	---	0	---	---	---	0	103	103	103	24	110	112	114	24	
3/4	101	102	102	24	---	---	---	0	---	---	---	0	---	---	---	0	102	102	102	24	106	107	109	24	
3/5	101	101	101	24	---	---	---	0	---	---	---	0	---	---	---	0	102	104	110	24	105	107	111	20	
3/6	102	102	102	24	---	---	---	0	---	---	---	0	---	---	---	0	101	102	102	24	101	102	102	24	
3/7	102	103	103	24	---	---	---	0	---	---	---	0	---	---	---	0	102	102	102	24	---	---	---	0	
3/8	103	103	103	7	---	---	---	0	---	---	---	0	---	---	---	0	102	102	102	6	101	101	101	6	
3/9	103	104	105	24	---	---	---	0	---	---	---	0	---	---	---	0	102	103	103	24	101	101	101	24	
3/10	103	104	104	18	---	---	---	0	---	---	---	0	---	---	---	0	102	102	102	18	101	101	101	18	
3/11	104	104	105	24	---	---	---	0	102	102	102	11	102	102	104	13	102	102	102	24	101	101	101	24	

### Total Dissolved Gas Saturation Data at Lower Columbia Sites

Date	<u>McNary-Oregon</u>				<u>McNary-Wash.</u>				<u>Tlwtr McNary</u>				<u>John Day</u>				<u>Tlwtr John Day</u>				<u>The Dalles</u>				
	<u>24 h</u>		<u>12 h</u>		#	<u>24 h</u>		<u>12 h</u>		#	<u>24 h</u>		<u>12 h</u>		#	<u>24 h</u>		<u>12 h</u>		#	<u>24 h</u>		<u>12 h</u>		#
	Avg	Avg	High	hr		Avg	Avg	High	hr		Avg	Avg	High	hr		Avg	Avg	High	hr		Avg	Avg	High	hr	
2/26	102	102	102	24	101	102	102	24	107	110	110	24	---	---	---	0	---	---	---	0	---	---	---	0	
2/27	102	102	102	2	102	102	102	2	108	108	109	2	---	---	---	0	---	---	---	0	---	---	---	0	
2/28	103	103	104	24	103	103	104	24	104	104	104	24	---	---	---	0	---	---	---	0	---	---	---	0	
3/1	103	104	104	24	103	104	104	24	103	104	104	24	---	---	---	0	---	---	---	0	---	---	---	0	
3/2	105	106	107	24	105	106	108	24	114	115	116	24	---	---	---	0	---	---	---	0	---	---	---	0	
3/3	106	106	106	2	108	108	108	2	115	115	115	2	---	---	---	0	---	---	---	0	---	---	---	0	
3/4	104	104	105	24	104	104	105	11	112	112	112	24	---	---	---	0	---	---	---	0	---	---	---	0	
3/5	102	103	103	24	102	102	102	24	113	114	116	24	---	---	---	0	---	---	---	0	---	---	---	0	
3/6	102	102	102	2	---	---	---	0	112	112	112	2	---	---	---	0	---	---	---	0	---	---	---	0	
3/7	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	
3/8	103	103	104	23	103	103	103	23	103	103	103	24	---	---	---	0	---	---	---	0	---	---	---	0	
3/9	102	102	103	24	102	102	103	24	106	108	109	24	---	---	---	0	---	---	---	0	---	---	---	0	
3/10	102	102	102	18	101	102	102	18	110	111	112	18	---	---	---	0	---	---	---	0	---	---	---	0	
3/11	102	102	103	24	102	102	102	24	106	109	113	24	---	---	---	0	---	---	---	0	---	---	---	0	

### Total Dissolved Gas Saturation Data at Lower Columbia Sites

Date	<u>Dnstr T. Dalles</u>				<u>Bonneville</u>				<u>Warrendale</u>				<u>Skamania</u>				<u>Camas\Wash.</u>				<u>Wauna Mill</u>				
	<u>24 h</u>		<u>12 h</u>		#	<u>24 h</u>		<u>12 h</u>		#	<u>24 h</u>		<u>12 h</u>		#	<u>24 h</u>		<u>12 h</u>		#	<u>24 h</u>		<u>12 h</u>		#
	Avg	Avg	High	hr		Avg	Avg	High	hr		Avg	Avg	High	hr		Avg	Avg	High	hr		Avg	Avg	High	hr	
2/26	---	---	---	0	101	102	102	24	102	102	104	18	101	102	102	24	---	---	---	0	---	---	---	0	
2/27	---	---	---	0	102	102	103	24	---	---	---	0	102	102	103	24	---	---	---	0	---	---	---	0	
2/28	---	---	---	0	102	102	103	24	---	---	---	0	102	102	103	24	---	---	---	0	---	---	---	0	
3/1	---	---	---	0	101	102	102	24	110	112	---	14	101	101	102	24	---	---	---	0	---	---	---	0	
3/2	---	---	---	0	103	103	104	24	103	104	104	24	103	103	104	24	---	---	---	0	---	---	---	0	
3/3	---	---	---	0	103	103	104	24	103	104	105	24	102	103	104	24	---	---	---	0	---	---	---	0	
3/4	---	---	---	0	102	102	103	24	103	104	106	24	102	102	104	24	---	---	---	0	---	---	---	0	
3/5	---	---	---	0	101	102	102	24	105	107	108	24	103	104	105	24	---	---	---	0	---	---	---	0	
3/6	---	---	---	0	103	104	104	24	105	106	108	24	104	104	105	24	---	---	---	0	---	---	---	0	
3/7	---	---	---	0	104	104	104	24	104	105	105	24	104	104	104	24	---	---	---	0	---	---	---	0	
3/8	---	---	---	0	103	103	103	24	103	103	104	24	103	103	103	24	---	---	---	0	---	---	---	0	
3/9	---	---	---	0	102	102	103	24	103	103	104	24	102	102	102	24	102	102	103	20	---	---	---	0	
3/10	---	---	---	0	102	102	102	24	105	107	108	24	103	104	105	24	102	103	105	23	---	---	---	0	
3/11	---	---	---	0	102	103	103	24	105	106	107	24	103	104	104	24	104	104	105	23	---	---	---	0	



### Cumulative Adult Passage at Mainstem Dams Through March 09, 1999

DAM	Spring Chinook						Summer Chinook						Fall Chinook					
	1999		1998		10-Yr Avg.		1999		1998		10-Yr Avg.		1999		1998		10-Yr Avg.	
	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack	Adult	Jack
BON	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LWG	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
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

DAM	Coho						Sockeye			Steelhead				
	1999		1998		10-Yr Avg.		10-Yr Avg.			10-Yr Avg.			Wild	
	Adult	Jack	Adult	Jack	Adult	Jack	1999	1998	Avg.	1999	1998	Avg.	1999	
BON	0	0	0	0	0	0	0	0	0	0	0	0	6	0
TDA	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
MCN	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
LMN	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LGS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LWG	0	0	0	0	0	0	0	0	0	0	554	435	431	32
PRD	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
RRH	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

\* Adult count records at Little Goose Dam have been maintained since 1991, visual counts were not conducted at Little Goose Dam between 1982 and 1990.

\*No Video counts at Lower Granite Dam on 3/1/99 and 3/2/99.

\*From 3/3/99 to 3/31/99 at Lower Granite Dam counts will be from 8:00 AM to 4:00 PM.

\*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.