



Fish Passage Center

Weekly Report #99 - 8

April 30, 1999

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SUMMARY OF EVENTS:

Water Supply: Precipitation for the April 1 through 27 period was below normal in the entire basin, with maximum precipitation of 92% at Columbia above Castlegar and 86% at the Snake River Plain. Precipitation above Grand Coulee was 55% of normal, Columbia above The Dalles was 54% of normal and Snake River above Ice Harbor was 62% of normal. The cumulative precipitation for October-April period decreased, compared with the previous period of October-March. The Columbia River above Grand Coulee was 108%, the Columbia River above The Dalles was 109% and the Snake River above Ice Harbor was 105%.

System Storage: The system operations for flood control end this week. It is expected that the regulating agencies will commence with system refill after May 1st.

Hungry Horse was drafted below the end of April flood control elevation for maintenance work. The reservoir continues to be managed with outflow in the range of 200-330 cfs during weekend and 2.9 kcfs-4.86 kcfs during working days. The State of Montana insisted, and the COE agreed, to include elevation targets for the end of April based on Integrated Rule Curves. Integrated Rule Curves is a method for calculating reservoir elevations developed by State of Montana. The end of April elevation based on the IRCs is 3486 ft.

Libby continues at a minimum outflow of 4 kcfs. The COE failed to operate the reservoir to an April 10 elevation that would enable the refill of the pool by June 30, while meeting requirements for sturgeon spawning flows. The reservoir was drafted to flood control elevations during January through February period. It is projected that the reservoir will be full by the end of July.

Arrow reservoir continues to be operated with a steady outflow of 20 kcfs to limit trout spawning areas during April-May period. This operation and low precipitation continue to affect inflows to Grand Coulee.

Grand Coulee drafted from 1226.1 ft on April 22 to 1222.3 ft on April 28. The reservoir operated during the past week with an outflow in the range of 140.4 kcfs-171.0 kcfs.

Dworshak reservoir continues to have high inflows due to local snowmelt and the reservoir elevation is increasing. Currently the reservoir is operated at 14 kcfs (powerhouse capacity is 10 kcfs).

Brownlee reservoir was drafted to an end of April flood control elevation and IPCo is expecting further directions from regulating agencies on reservoir management. Currently the inflows remain high, in the range 40 kcfs-50 kcfs. Outflows at Hells Canyon Dam continues to be in the range of 40 kcfs-56 kcfs, requiring continuation of spill.

A summary of the current elevations on April 29 with end of April flood control elevations are given in the following Table:

Reservoir	Actual elev. As of April 29 [ft]	Max Reservoir pool [ft]	End of April Flood Control Elev. [ft]
Libby	2337.48	2459	2339.8
Hungry Horse	3489.22	3560	3491.0
Grand Coulee	1221.30	1290	1220.2
Brownlee	1990.50*	2077	1990.0
Dworshak	1452.89	1600	1445.0

* as of April 28

Upper Snake reservoirs:

Currently all reservoirs continue to be operated for flood control. As of April 28, BOR continues to operate American Falls to 92%-93% of full, passing inflow. Palisades, as required for flood control, is 28% of full. Decrease in precipitation in region resulted in lower flows at Milner of 4.2 kcfs (as of April 28), compared with flows in the range of 6-8.5 kcfs in previous week. The system continues to be held at 67% of capacity.

Boise and Payette River Basins:

The reservoirs continue to be operated for flood control. The Boise River system (Anderson Ranch, Arrowrock and Lucky Peak) is at 47% of capacity. The Payette River system (Cascade, Deadwood) is at 52% of capacity.

Streamflow: Spring flow target based on the April Final Runoff Volume Forecast is 100/kcfs at Lower Granite and 260 kcfs at McNary. The COE's SSARR projections are showing that seasonal spring flow targets at both projects will be met during the entire spring season. Cold weather and delayed snowmelt with low precipitation in the whole basin resulted in lower flows than minimum BiOp required flows in the basin during the first three weeks of April. Flows are currently higher than required by BiOp minimum flow targets.

Flows at Priest Rapids were fluctuating from 168.4 kcfs to 202.2 kcfs during April 23-29 period. The project is operated with variable success during the spring related to Salmon Managers System Operational Request SOR # 99-3. The hourly fluctuations remained unstable with a wide range. The total range of daily hourly fluctuations is presented in the following table:

Date	Average Daily Flow at Priest Rapids [kcfs]	Hourly fluctuations [kcfs]
April 23	177.6	161.8-186.6
April 24	171.3	161.3-181.7
April 25	170.1	153.7-189.0
April 26	168.4	158.2-189.8
April 27	180.1	165.6-188.6
April 28	188.7	159.2-200.2
April 29	202.2	185.9-230.1

The average weekly flows on the major run-off river projects were increasing compared to the previous week. The average discharge for the major run of river projects for the April 16-29 period are given in the following Table:

Project	Average Discharge [kcfs]	
	April 23-29	April 16-22
<i>Priest Rapids</i>	179.8	126.2
<i>McNary</i>	302.01	226.6
<i>Lower Granite</i>	114.4	103.6
<i>Bonneville</i>	318.3	239.2

Spill: Outflow from Dworshak Dam continued at 14 Kcfs with spill occurring above hydraulic capacity (approximately 3.6 Kcfs spill). Spill continues at the Hells Canyon complex due to high inflows to Brownlee and to achieve its end of April flood control elevation. The Biological Opinion spill program is presently being implemented at the lower Snake projects. The Fishery Agencies and Tribes requested through a System Operational Request that the operating agencies review the total dissolved gas levels in the system and increase spill levels up to the waivers.

The COE has determined that the navigation lock training wall and cells are not responsible for the low total dissolved gas readings at the Ice Harbor tailrace monitor. Transect information collected this past week suggests that total dissolved gas levels at the fixed monitoring station are 2-4% lower than the readings from the transect locations nearest to the fixed monitor. The COE has identified the standpipe (in which the monitor sits) as the possible reason for the biased low readings. They will visit the site next Wednesday to correct the problem. In the mean time, the COE will continue the present spill levels.

Biological Opinion spill levels were initiated at midnight on April 20, 1999 at the lower Columbia projects. Spill at The Dalles Dam will alternate between 30% and 64% of instantaneous flow for research purposes.

Levels of total dissolved gas were meeting the waivers at locations measured. Monitoring for signs of gas bubble trauma (GBT) on fish collected through the Smolt Monitoring Program showed few fish with signs of GBT.

Smolt Monitoring. Following last weeks rapid increase in passage of chinook and steelhead at Lower Granite Dam, this week has seen passage indices of hatchery chinook fluctuating between 54,000 and 97,000 fish and those of hatchery steelhead fluctuating between 60,000 and 126,000 fish. Wild yearling chinook passage indices remained in the vicinity of 20,000 fish at Lower Granite Dam during most of this week, while wild steelhead passage indices dropped from around 25,000 fish the first two days of this week to between 7,000 and 13,000 fish during the remaining five days. As of April 29, the passage timing of wild and hatchery steelhead and wild chinook is fairly close to the historic average timing distribution at Lower Granite Dam. The hatchery yearling chinook passage timing at Lower Granite Dam as of April 29 is about a week later than the historic average timing distribution. Wild and hatchery chinook and steelhead continued an increasing trend in passage at Little Goose and Lower Monumental dams throughout this week.

In the Mid-Columbia River, the Rock Island Dam passage indices of wild steelhead rose during the course of this week to a level of 250 fish by week's end. Yearling chinook (combined hatchery/wild fish) and wild sockeye passage indices at Rock Island Dam fluctuated greatly this week, within the 313-1,823 range for chinook and the 24-2,318 range for sockeye.

In the lower Columbia River, yearling chinook (combined hatchery/wild fish) dominate the passage indices at McNary and John Day dams, with passage indices ending the week lower than they started this week. Wild and hatchery steelhead passage indices at these two dams increased from last week's level, but showed a fairly flat trend in passage this week. Strong increasing trends in passage this week were observed with wild sockeye at McNary Dam and coho at John Day Dam. At Bonneville Dam, passage indices of yearling chinook, coho, and steelhead all increased greatly this week from last week's level, but the trend in passage this week has been fairly flat. Since April 21, the subyearling chinook passage indices at Bonneville Dam have been higher as a result of Spring Creek Hatchery's April release of tule fall chinook.

Adult Fish Passage: At Bonneville Dam, daily passage counts of adult spring chinook ranged from 827 to 1399 through the week ending April 29. The season total was 16,827 and remained well below the 1998 (23,725) and 10-year average count (42,080). Of the chinook past Bonneville, 4,673 [28% of the Bonneville total] have been reported at The Dalles Dam, 2,337 at John Day Dam, and 938 at McNary Dam. Through April 29, a total of 178 adult chinook have been counted at the lower Snake River dam (Ice Harbor) with 19 adult spring chinook counted at Lower Granite Dam to date. In the Mid-Columbia River, 84 adult spring chinook have been counted at Priest Rapids, four at Rock Island and three counted at Rocky Reach Dam.

At Bonneville Dam, the daily passage of steelhead was between 10 and 35 per day for the past week, with the cumulative count for the season at 1,155. Of this total, 17% or 191 were "wild" origin steelhead. At Lower Granite Dam, steelhead passage since March 1 totaled 2,940, about 70% and 54% of the respective 1998 and 10-year average. Of the total, 476 were recorded as being "wild" steelhead (about 16.2% of the run).

Hatchery Releases: The Hatchery Release tables show the number of fish released from Columbia River basin hatcheries during the past two weeks and for the upcoming two weeks. During the past two weeks, approximately 26.6 million anadromous salmon were released from hatcheries, acclimation ponds, or were directly planted into streams. For the upcoming two weeks, about 5.2 million salmon are scheduled for release from basin hatcheries into the rivers and tributaries above Bonneville Dam. More than 79 million juvenile salmon of hatchery origin were scheduled for release into streams above Bonneville Dam for the 1999 Migration Year. Most yearling spring, summer, and fall chinook have been released from the hatcheries in each River Reach. Steelhead and coho have been planted through the past two weeks and releases will continue through mid to late May. Upriver bright fall chinook are normally released from mid to late May through late June.

Lower Columbia River (above Bonneville Dam to McNary Dam) – Release of yearling spring chinook from Klickitat Hatchery, Umatilla River acclimation ponds, and from Warm Springs NFH have been made to date. Carson, Little White Salmon, Round Butte, and other acclimation facilities finished releasing fish this past week. Steelhead releases were completed in the Umatilla, Hood, and Deschutes rivers. The third release of subyearling fall chinook (about 3.2 million) from Spring Creek NFH is scheduled for May 13, 1999.

Mid-Columbia River - Yearling spring chinook have been released into the Columbia River from Ringold Hatchery. Other sites or river systems where chinook were released include the Entiat and Yakama rivers. Yearling spring chinook were released in the Wenatchee and Methow River basins through the end of the month. Steelhead were released into the Wenatchee, Methow, Okanogan, and Entiat rivers this past week and continue through mid-May. Many of these steelhead are listed under the ESA this year. Steelhead were released from Ringold Hatchery from mid to late March. Coho will be released from various acclimation sites and ponds in the Mid-Columbia, with the Wenatchee River slated to receive coho this season. Most of the tribal releases of coho in the Yakima River basin are scheduled for this next week. Sockeye (Osoyoos stock) were released on April 7 from the Cassimer Bar facility; the Lake Wenatchee stock sockeye were released from net pens into Lake Wenatchee in the fall (1998). About 197,000 were released for the 1999 migration season.

Snake River – Yearling spring and summer chinook from State, Federal or Tribal hatcheries have been released in the Clearwater, Salmon, Grande Ronde, Imnaha, Pahsimeroi and Tucannon, River basins as well as at Hells Canyon on the Snake River from mid-March through this week. Both volitional and direct stream releases have been used from the hatcheries. The spring and summer chinook releases are completed for the 1999 migration season. Steelhead were

released from hatcheries and acclimation ponds during the week or are scheduled for release during the next two weeks. Yearling fall chinook have been released into the Snake River from Lyons Ferry Hatchery and into the Clearwater and Snake Rivers from acclimation ponds located in the Snake and Clearwater rivers.

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
04/16/99	106.8	0.0	112.9	0.0	115.5	11.6	115.0	0.0	114.9	0.0	95.2	0.0	96.7	0.0
04/17/99	110.7	0.0	113.3	0.0	119.3	11.6	115.9	0.0	118.7	0.0	99.9	0.0	99.6	0.0
04/18/99	100.1	0.0	102.0	0.0	113.0	11.1	117.3	0.0	121.5	0.0	125.4	0.0	125.8	0.0
04/19/99	112.6	0.0	115.5	0.0	120.4	12.2	119.7	0.0	125.5	0.0	127.3	0.0	131.7	0.0
04/20/99	104.2	0.0	97.8	0.0	104.6	11.6	106.4	4.2	112.7	17.3	118.9	0.0	128.8	0.0
04/21/99	145.4	0.0	150.1	0.0	153.5	13.1	151.1	21.1	153.5	41.0	136.6	7.7	130.2	1.6
04/22/99	149.8	0.0	151.6	0.0	164.6	13.2	161.6	23.8	164.6	40.9	161.9	32.4	170.4	29.7
04/23/99	140.4	0.0	152.6	0.0	156.5	13.2	162.8	25.0	171.0	40.8	168.5	33.8	177.6	142.3
04/24/99	151.7	0.0	149.7	0.0	158.5	13.2	155.8	24.5	160.9	41.0	156.2	31.6	171.3	137.9
04/25/99	147.4	0.0	142.6	0.0	151.6	13.1	148.7	23.8	154.5	41.0	156.3	32.2	170.1	136.4
04/26/99	157.6	0.0	160.6	0.0	172.0	13.2	173.2	26.5	177.6	40.8	163.1	32.6	168.4	135.8
04/27/99	164.5	0.0	163.2	0.0	173.1	14.0	174.5	26.6	180.6	40.9	168.3	34.4	180.1	144.7
04/28/99	171.0	0.0	175.3	0.0	187.4	20.2	191.0	40.0	196.7	40.9	180.4	36.5	188.7	152.0
04/29/99	166.1	0.0	169.2	0.0	178.3	10.9	183.4	32.1	187.7	40.8	186.2	36.9	202.2	163.0

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

Date	Dworshak		Brownlee Canyon		Hells		Lower Granite		Little Goose		Lower Monumental		Ice Harbor	
	Flow	Spill	Inflow	Outflow	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
04/16/99	7.8	0.0	40.7	42.7	83.2	35.1	79.2	24.7	83.0	17.6	88.0	63.7		
04/17/99	8.4	0.0	41.4	42.8	85.2	35.4	81.6	24.4	85.7	19.1	88.8	62.6		
04/18/99	10.2	0.0	42.5	43.1	91.0	35.2	85.3	24.5	88.5	17.6	92.4	62.8		
04/19/99	10.3	0.0	45.4	50.9	98.3	33.8	95.7	23.7	101.2	17.6	104.5	65.1		
04/20/99	10.3	0.0	48.2	49.7	118.7	33.4	113.6	23.6	121.2	20.9	126.5	67.9		
04/21/99	12.8	2.4	50.6	50.2	126.3	32.6	123.0	32.8	130.1	19.7	130.8	71.5		
04/22/99	14.0	3.6	48.6	55.2	122.4	32.5	117.9	19.1	124.7	13.1	127.1	72.2		
04/23/99	14.1	3.6	44.2	39.8	118.7	33.3	112.8	18.3	119.3	14.0	123.3	71.5		
04/24/99	14.1	3.6	43.6	46.0	103.9	34.4	101.7	17.7	107.3	14.1	113.0	69.6		
04/25/99	14.0	3.6	41.7	39.9	110.7	51.3	104.3	14.6	107.9	13.9	110.4	69.9		
04/26/99	14.0	3.7	42.4	49.3	113.7	45.1	109.6	14.7	114.8	12.3	116.9	69.8		
04/27/99	14.0	3.7	39.6	42.6	123.2	48.9	117.5	15.2	124.3	13.5	127.6	72.1		
04/28/99	14.1	3.7	39.3	33.3	122.0	47.4	119.0	27.6	126.7	16.7	130.2	72.9		
04/29/99	13.2	2.9	---	---	108.9	34.4	99.2	17.2	102.2	14.8	108.9	68.6		

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		
04/16/99	195.5	51.1	197.8	33.4	195.2	59.0	209.0	49.8	68.4	81.6
04/17/99	182.1	51.1	179.1	33.7	178.6	49.0	186.3	50.0	73.8	53.3
04/18/99	207.1	51.1	216.2	39.6	208.3	63.0	228.7	49.7	79.5	90.3
04/19/99	205.0	51.3	221.2	38.1	219.3	65.0	224.6	50.2	76.3	88.9
04/20/99	267.1	114.2	259.9	55.0	249.4	73.0	251.7	85.3	76.4	80.8
04/21/99	255.4	119.1	275.5	55.0	278.7	96.0	283.8	88.2	31.6	154.8
04/22/99	274.3	116.0	287.0	55.3	291.1	176.0	290.6	92.6	71.2	117.5
04/23/99	323.3	156.6	331.9	75.7	326.6	205.0	324.5	106.9	72.1	136.2
04/24/99	286.7	123.2	302.6	61.4	299.9	189.0	313.1	100.4	72.3	131.2
04/25/99	292.6	131.1	306.9	63.6	309.6	114.0	309.4	97.7	72.3	130.2
04/26/99	284.3	118.7	297.7	78.0	287.6	87.0	305.8	98.2	73.8	124.4
04/27/99	291.8	126.1	298.9	90.0	297.3	88.0	302.2	100.2	67.8	125.0
04/28/99	321.1	160.9	337.0	97.1	334.3	208.0	338.0	131.8	68.2	128.8
04/29/99	314.3	147.7	332.4	79.5	326.6	203.0	335.2	139.4	75.7	110.9

Total Dissolved Gas Saturation (%) - Average of 12 Highest Hours, 24 h Average and 24 h High²

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>								
	24 h		12 h	24 h		12 h	24 h		12 h	24 h		12 h	24 h		12 h	24 h		12 h	24 h		12 h	#		
	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr
4/16	104	105	106	24	106	107	108	24	103	104	104	24	---	---	---	0	104	105	105	20	105	105	107	23
4/17	104	105	109	24	108	108	108	24	104	104	105	24	---	---	---	0	105	105	106	23	106	107	107	22
4/18	104	105	106	24	108	108	109	24	104	104	104	24	---	---	---	0	105	105	105	24	107	107	107	23
4/19	108	112	114	24	108	108	109	24	104	104	105	24	---	---	---	0	105	105	105	20	104	106	108	23
4/20	108	111	113	24	107	108	109	24	105	105	106	24	---	---	---	0	105	105	105	19	103	104	105	21
4/21	108	111	111	24	108	108	108	24	105	105	106	20	---	---	---	0	105	105	105	21	103	103	103	11
4/22	110	110	111	24	107	108	109	24	105	105	106	24	---	---	---	0	104	105	105	22	106	107	108	15
4/23	113	116	116	24	109	109	111	24	106	107	107	24	104	104	104	1	104	104	105	11	107	108	109	23
4/24	116	116	117	24	110	111	112	24	107	108	108	24	---	---	---	0	---	---	---	0	109	109	110	23
4/25	117	119	121	24	111	112	112	24	108	108	109	24	---	---	---	0	---	---	---	0	109	109	110	22
4/26	119	120	121	24	109	110	111	24	107	107	108	24	---	---	---	0	107	107	107	15	109	109	109	20
4/27	117	118	118	24	109	110	112	24	107	107	107	24	---	---	---	0	107	107	107	24	109	109	109	21
4/28	116	118	118	24	108	108	109	24	106	107	107	24	---	---	---	0	106	106	107	24	109	109	109	21
4/29	117	118	119	24	108	108	110	24	106	106	107	24	---	---	---	0	106	106	107	24	109	110	110	22

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>								
	24 h		12 h	24 h		12 h	24 h		12 h	24 h		12 h	24 h		12 h	24 h		12 h	24 h		12 h	#		
	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr
4/16	107	107	108	22	105	106	107	23	107	108	109	23	---	---	---	0	---	---	---	0	---	---	---	0
4/17	108	108	109	21	107	107	107	23	108	108	109	22	---	---	---	0	---	---	---	0	---	---	---	0
4/18	108	108	108	23	107	107	108	23	108	108	109	23	---	---	---	0	---	---	---	0	---	---	---	0
4/19	108	108	108	21	106	106	107	23	108	108	108	23	---	---	---	0	---	---	---	0	---	---	---	0
4/20	108	108	109	20	106	106	106	22	112	116	119	22	---	---	---	0	---	---	---	0	---	---	---	0
4/21	110	110	111	12	108	109	109	23	118	119	120	23	---	---	---	0	---	---	---	0	---	---	---	0
4/22	111	111	111	8	107	107	108	24	117	118	119	24	---	---	---	0	---	---	---	0	---	---	---	0
4/23	112	113	114	18	107	108	108	21	117	117	118	18	---	---	---	0	---	---	---	0	---	---	---	0
4/24	115	116	117	22	109	110	111	24	119	119	120	24	---	---	---	0	---	---	---	0	---	---	---	0
4/25	118	118	119	21	110	110	110	22	119	119	120	20	---	---	---	0	---	---	---	0	---	---	---	0
4/26	120	120	122	13	109	109	109	19	117	118	119	16	112	112	113	24	118	119	121	0	115	115	115	24
4/27	116	120	122	19	109	110	110	21	117	118	118	19	---	---	---	0	---	---	---	0	---	---	---	0
4/28	111	112	113	20	111	111	112	21	118	118	119	17	---	---	---	0	---	---	---	0	---	---	---	0
4/29	111	112	113	21	111	111	112	21	119	119	120	18	---	---	---	0	---	---	---	0	---	---	---	0

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

Date	<u>Anatone</u>			<u>Dworshak</u>			<u>Clearwater</u>			<u>Snake-Lewiston</u>			<u>Lower Granite</u>			<u>Tlwr L. Granite</u>								
	24 h		12 h	24 h		12 h	24 h		12 h	24 h		12 h	24 h		12 h	24 h		12 h	24 h		12 h	#		
	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr
4/16	---	---	---	0	102	103	103	24	---	---	---	0	102	105	106	24	107	109	110	24	112	118	119	24
4/17	---	---	---	0	102	103	103	24	---	---	---	0	103	104	106	24	109	110	111	24	113	118	119	24
4/18	---	---	---	0	102	102	102	24	102	102	102	24	102	103	105	24	107	108	109	24	113	118	120	24
4/19	---	---	---	0	101	101	102	24	101	102	102	24	101	102	103	24	106	106	107	24	112	118	119	24
4/20	---	---	---	0	101	102	102	24	101	101	102	24	101	102	102	24	105	105	106	24	113	118	119	24
4/21	---	---	---	0	106	109	109	24	103	104	105	24	102	103	104	24	105	105	105	24	112	118	118	24
4/22	---	---	---	0	108	109	109	24	104	104	105	23	103	104	105	23	104	105	105	24	112	117	118	24
4/23	---	---	---	0	105	106	107	23	---	---	---	0	104	106	107	24	105	106	107	24	112	118	119	24
4/24	---	---	---	0	105	106	107	24	---	---	---	0	104	106	107	24	108	109	110	24	113	118	119	24
4/25	---	---	---	0	110	110	110	24	105	106	106	24	104	105	106	24	108	109	109	15	115	120	122	24
4/26	---	---	---	0	109	110	110	24	104	105	105	24	103	104	104	24	106	106	106	24	116	119	121	24
4/27	---	---	---	0	109	109	110	24	104	104	105	24	103	104	104	24	105	105	107	24	117	120	122	24
4/28	105	105	106	24	109	109	109	24	103	103	104	23	102	102	102	24	104	104	105	24	117	120	121	24
4/29	104	105	105	24	107	108	109	23	104	104	105	23	103	104	104	23	104	104	105	24	112	118	121	24

Total Dissolved Gas Saturation (%) - Average of 12 Highest Hours, 24 h Average and 24 h High²

Total Dissolved Gas Saturation Data at Snake Sites

Date	<u>Little Goose</u>			<u>Tlptr L. Goose</u>			<u>Lower Mon.</u>			<u>Tlptr L. Mon</u>			<u>Ice Harbor</u>			<u>Tlptr Ice Harbor</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	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr						
4/16	114	116	119	24	117	120	120	24	117	120	125	24	116	117	118	24	116	117	118	24	112	113	114	24
4/17	115	117	118	24	117	120	120	24	119	121	123	24	118	118	119	24	118	119	121	24	112	112	113	24
4/18	115	116	118	24	118	120	120	24	118	120	121	24	118	119	119	24	118	118	119	24	112	112	113	24
4/19	114	115	116	23	117	120	123	24	117	119	119	24	119	119	119	24	117	117	118	24	111	113	115	24
4/20	113	115	115	24	116	119	120	24	117	118	120	24	117	118	119	24	116	117	117	24	115	117	118	24
4/21	112	113	115	24	116	118	119	24	115	117	118	24	117	119	119	24	116	116	116	24	116	117	118	24
4/22	110	113	116	24	113	116	117	24	115	117	118	24	117	118	119	24	115	116	116	24	116	118	119	24
4/23	111	114	116	24	113	116	117	24	114	115	116	23	116	117	118	24	115	116	117	24	116	118	120	24
4/24	113	114	119	24	114	116	117	24	115	116	118	24	116	116	118	24	116	117	118	24	115	117	118	24
4/25	114	116	118	24	113	115	116	24	115	117	118	24	115	117	118	24	115	115	115	24	114	116	117	24
4/26	113	115	116	24	113	114	115	24	113	114	114	24	113	116	117	24	113	113	114	24	114	115	116	24
4/27	114	116	118	24	114	115	116	24	113	113	114	24	114	116	118	24	112	112	112	14	115	116	117	14
4/28	113	114	116	24	115	116	117	23	113	113	114	23	114	116	117	24	112	112	113	24	116	118	119	24
4/29	114	115	116	22	114	116	118	24	115	116	117	24	114	115	117	24	112	113	113	24	115	117	118	24

Total Dissolved Gas Saturation Data at Lower Columbia Sites

Date	<u>McNary-Oregon</u>			<u>McNary-Wash.</u>			<u>Tlptr McNary</u>			<u>John Day</u>			<u>Tlptr John Day</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>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	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr						
4/16	109	111	111	24	109	110	111	24	112	112	113	24	106	108	109	24	112	117	119	24	109	110	111	24
4/17	111	112	116	18	110	111	113	20	112	112	113	20	107	107	108	24	112	117	119	24	108	109	110	24
4/18	---	---	---	0	---	---	---	0	---	---	---	0	107	108	108	23	114	119	120	24	108	110	110	23
4/19	111	111	114	24	110	110	111	24	112	113	113	24	109	109	110	23	114	118	120	24	109	110	110	23
4/20	110	110	111	24	109	109	109	24	118	119	120	24	109	109	109	23	115	121	122	24	109	111	113	23
4/21	109	110	112	24	108	109	109	24	118	119	120	24	108	108	108	23	114	120	120	24	109	110	111	23
4/22	109	109	110	24	109	109	110	24	118	119	119	24	106	106	107	23	113	120	120	24	107	109	110	23
4/23	111	113	115	24	110	110	111	24	121	121	123	24	107	108	110	24	117	120	120	24	108	109	111	24
4/24	113	115	118	24	112	114	116	24	120	121	122	24	110	111	114	23	116	120	120	24	110	111	112	23
4/25	114	114	115	24	115	116	117	24	121	122	123	24	112	112	113	23	117	120	120	24	110	111	111	23
4/26	114	114	114	24	114	114	115	24	119	120	121	24	112	113	113	23	118	120	120	24	110	111	112	23
4/27	112	113	114	24	112	113	114	24	120	120	121	24	111	111	112	22	119	120	120	24	111	112	113	23
4/28	112	112	113	24	112	113	114	24	121	122	123	24	110	110	110	7	120	120	121	5	109	109	110	7
4/29	113	114	115	24	113	115	115	24	121	121	121	24	110	111	113	23	117	120	121	24	111	112	113	22

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>CamasWash.</u>			<u>Wauna Mill</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	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr						
4/16	114	115	115	24	110	111	111	24	113	114	115	24	112	114	115	24	108	109	110	24	---	---	---	0
4/17	112	114	115	24	112	114	114	24	114	115	116	24	115	117	117	24	112	114	115	24	---	---	---	0
4/18	113	114	114	24	111	112	113	23	115	115	115	23	114	114	116	23	114	114	115	24	---	---	---	0
4/19	113	114	114	24	110	110	111	23	113	114	114	23	112	113	114	23	112	113	113	24	---	---	---	0
4/20	114	115	116	24	110	110	111	23	113	114	115	23	113	114	115	23	112	113	115	24	---	---	---	0
4/21	114	115	115	24	111	111	111	23	114	115	116	23	113	113	114	23	113	114	115	24	---	---	---	0
4/22	116	117	117	24	111	111	112	23	114	115	117	23	113	114	115	23	113	114	116	23	---	---	---	0
4/23	117	118	118	24	114	116	117	24	117	119	121	24	116	118	119	24	114	116	117	24	---	---	---	0
4/24	118	118	119	24	118	118	119	24	120	120	121	24	119	120	120	24	118	120	121	24	---	---	---	0
4/25	116	117	119	24	115	116	118	23	118	119	121	23	117	118	120	23	117	117	118	24	---	---	---	0
4/26	114	115	116	24	112	113	114	23	116	117	118	23	115	116	117	23	115	116	117	24	---	---	---	0
4/27	115	116	117	24	112	112	113	23	116	117	118	23	114	115	116	23	113	114	115	24	---	---	---	0
4/28	118	118	119	8	112	112	112	7	118	118	119	7	116	116	116	7	113	113	113	8	---	---	---	0
4/29	119	119	120	24	115	116	116	23	120	121	121	23	118	119	120	23	117	120	121	24	---	---	---	0

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

Site	Date	Species	Number of Fish	Number w GBT signs	Number w Fin Signs	% Fin GBT	% Severe Fin GBT	Number of Fish with Fin GBT Listed by Highest Rank				Fish with L. Line GBT	
								Rank 1	Rank 2	Rank 3	Rank 4	Num Fish	Avg. Rank
Lower Granite Dam													
	04/26/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/26/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0
Little Goose Dam													
	04/21/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/21/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/28/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/28/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0
Lower Monumental Dam													
	04/26/99	Yearling Chinook	100	2	2	2.00%	0.00%	2	0	0	0	1	1
	04/26/99	Steelhead	100	4	2	2.00%	0.00%	2	0	0	0	2	1
Ice Harbor Dam													
	04/20/99	Yearling Chinook	100	4	0	0.00%	0.00%	0	0	0	0	4	1
	04/20/99	Steelhead	33	1	0	0.00%	0.00%	0	0	0	0	1	1
	04/23/99	Yearling Chinook	100	2	0	0.00%	0.00%	0	0	0	0	2	1
	04/23/99	Steelhead	39	1	0	0.00%	0.00%	0	0	0	0	1	1
	04/27/99	Yearling Chinook	100	2	0	0.00%	0.00%	0	0	0	0	2	1
	04/27/99	Steelhead	67	5	1	1.49%	0.00%	1	0	0	0	4	1
McNary Dam													
	04/22/99	Yearling Chinook	100	1	0	0.00%	0.00%	0	0	0	0	1	1
	04/22/99	Steelhead	23	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/26/99	Yearling Chinook	100	2	0	0.00%	0.00%	0	0	0	0	2	1
	04/26/99	Steelhead	44	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/29/99	Yearling Chinook	100	4	1	1.00%	0.00%	1	0	0	0	3	1
	04/29/99	Steelhead	44	0	0	0.00%	0.00%	0	0	0	0	0	0
Bonneville Dam													
	04/22/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/22/99	Steelhead	52	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/26/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/26/99	Steelhead	96	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/29/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/29/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0
Rock Island Dam													
	04/22/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/22/99	Steelhead	49	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/26/99	Yearling Chinook	100	5	5	5.00%	0.00%	1	4	0	0	0	0
	04/26/99	Steelhead	82	1	1	1.21%	0.00%	0	1	0	0	1	2
	04/29/99	Yearling Chinook	100	4	3	3.00%	0.00%	2	1	0	0	2	1
	04/29/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0

Hatchery Release Summary
For the Last Two Weeks
From 4/16/99 to 4/29/99

Hatchery	Species...	Migration	Year	Number ...Release Dates...			Release Site	River Name
				Released	Begin	..End		
IDFG								
Clearwater	SU	Steelhead	1999	5,000	4/20/99	4/20/99	S FK Red R	Clearwater Rvr M F
	SU	Steelhead	1999	422,000	4/28/99	4/30/99	S Fk Clearwater R	Clearwater Rvr M F
	SU	Steelhead	1999	170,000	4/28/99	4/28/99	Clear Cr	Clearwater Rvr M F
Magic Valley	SU	Steelhead	1999	360,200	4/10/99	4/20/99	Little Salmon R	Salmon River
	SU	Steelhead	1999	30,000	4/10/99	4/30/99	Sawtooth H	Salmon River
	SU	Steelhead	1999	343,640	4/15/99	4/20/99	Lemhi R	Salmon River
	SU	Steelhead	1999	293,930	4/20/99	4/23/99	McNabb/Salmon R	Salmon River
	SU	Steelhead	1999	119,970	4/21/99	4/23/99	Shoup Br (Salmon R)	Salmon River
	SU	Steelhead	1999	96,000	4/26/99	4/27/99	Salmon R	Salmon River
	SU	Steelhead	1999	312,000	4/27/99	5/5/99	Squaw Cr Acclim Pd	Salmon River
	SU	Steelhead	1999	301,000	4/27/99	5/3/99	E Fk Salmon R	Salmon River
	SU	Steelhead	1999	101,200	4/27/99	5/15/99	Squaw Cr Acclim Pd	Salmon River
Niagara Springs	SU	Steelhead	1999	830,000	4/11/99	4/29/99	Pahsimeroi H	Pahsimeroi River
Sawtooth	SP	Chinook	1999	107,000	4/16/99	4/16/99	Sawtooth H	Salmon River
	SP	Chinook	1999	118,000	4/16/99	4/16/99	Sawtooth H	Salmon River
	SU	Steelhead	1999	480,000	4/23/99	4/23/99	Sawtooth H	Salmon River
		Agency Total:		4,089,940				
Nez Perce Tribe								
Clearwater	SP	Chinook	1999	39,640	4/19/99	4/19/99	S Fk Clearwater R	Clearwater Rvr M F
Dworshak		Coho	1999	220,000	4/26/99	4/30/99	Clear Cr	Clearwater Rvr M F
		Agency Total:		259,640				
ODFW								
Big Canyon	SU	Steelhead	1999	120,000	4/8/99	4/21/99	Big Canyon H	Grande Ronde River
Cascade		Coho	1999	750,000	4/10/99	4/20/99	Umatilla R	Umatilla River
Round Butte	SU	Steelhead	1999	162,000	4/5/99	4/19/99	Bel. Pelton Dam	Deschutes River
Wallowa	SU	Steelhead	1999	217,000	4/1/99	4/19/99	Wallowa Acclim Pd	Grande Ronde River
		Agency Total:		1,249,000				

Hatchery Release Summary
For the Last Two Weeks
From 4/16/99 to 4/29/99

Hatchery	Species	Migration	Year	Number	...Release Dates...		Release Site	River Name
				Released	Begin	End		
Umatilla Tribe								
Bonifer	SU	Steelhead	1999	50,000	4/10/99	4/20/99	Bonifer Acclim Pd	Umatilla River
	SU	Steelhead	1999	50,000	4/20/99	4/30/99	Bonifer Acclim Pd	Umatilla River
Imeques	SP	Chinook	1999	275,000	4/10/99	4/20/99	Imeques Acclim Pd	Umatilla River
Minthorn	SU	Steelhead	1999	50,000	4/10/99	4/20/99	Minthorn Acclim Pd	Umatilla River
Thornhollow	FA	Chinook	1999	240,000	4/10/99	4/20/99	Thornhollow Acclim Pd	Umatilla River
	Agency Total:			665,000				
USFWS								
Carson	SP	Chinook	1999	1,421,000	4/20/99	4/20/99	Carson H	Wind River
Dworshak	SU	Steelhead	1999	600,000	4/19/99	4/23/99	S Fk Clearwater R	Clearwater Rvr M F
	SU	Steelhead	1999	200,000	4/19/99	4/23/99	Clear Cr	Clearwater Rvr M F
	SU	Steelhead	1999	1,300,000	4/26/99	4/30/99	Dworshak H	Clearwater Rvr M F
Hagerman	SU	Steelhead	1999	410,000	4/14/99	5/10/99	Little Salmon R	Salmon River
	SU	Steelhead	1999	230,000	4/19/99	4/23/99	Sawtooth H	Salmon River
Leavenworth	SP	Chinook	1999	1,650,000	4/19/99	4/19/99	Leavenworth H	Wenatchee River
L White Salmon	SP	Chinook	1999	1,077,000	4/20/99	4/20/99	Little White Salmon H	Little White Salmon River
Spring Creek	FA	Chinook	1999	3,600,000	4/22/99	4/22/99	Spring Creek H	Columbia River
Willard		Coho	1999	2,126,000	4/19/99	4/19/99	Little White Salmon R	Little White Salmon River
Winthrop	SU	Steelhead	1999	113,000	4/14/99	5/15/99	Winthrop H	Methow River
	Agency Total:			12,727,000				
WDFW								
Chewuch	SP	Chinook	1999	132,900	4/15/99	5/1/99	Chewuch R	Methow River
Chiwawa	SP	Chinook	1999	266,500	4/15/99	4/30/99	Chiwawa H	Wenatchee River
	SU	Steelhead	1999	187,400	4/22/99	5/7/99	Chiwawa H	Wenatchee River
East Bank	SU	Chinook	1999	442,000	4/15/99	4/30/99	Dryden Acclim Pd	Wenatchee River
Klickitat		Coho	1999	1,150,000	4/15/99	6/10/99	Klickitat H	Klickitat River
Lyons Ferry	SU	Steelhead	1999	250,000	3/25/99	4/30/99	Cottonwood Acclim Pd	Grande Ronde River
	SU	Steelhead	1999	125,000	3/25/99	4/30/99	Dayton Acclim Pd	Walla Walla River
	SU	Steelhead	1999	175,000	4/15/99	4/30/99	Walla Walla R	Walla Walla River
	SU	Steelhead	1999	160,000	4/20/99	4/20/99	Tucannon R	Tucannon River

Hatchery Release Summary For the Last Two Weeks From 4/16/99 to 4/29/99

Hatchery	Species	Migration	Year	Number ...Release Dates...			Release Site	River Name
				Released	Begin	End		
Methow	SP	Chinook	1999	334,000	4/15/99	4/25/99	Methow H	Methow River
	SP	Chinook	1999	26,850	4/15/99	4/25/99	Twisp R	Methow River
Skamania	WI	Steelhead	1999	10,000	4/15/99	4/30/99	Rock Cr	Columbia River
	SU	Steelhead	1999	50,000	4/15/99	4/30/99	Little White Salmon R	Little White Salmon River
	SU	Steelhead	1999	120,000	4/15/99	4/30/99	Klickitat R	Klickitat River
	WI	Steelhead	1999	40,000	4/15/99	4/30/99	Northwestern Lake	White Salmon River
Tucannon	SP	Chinook	1999	25,000	3/9/99	4/20/99	Curl Lake	Tucannon River
Turtle Rock	SU	Steelhead	1999	40,000	4/20/99	4/30/99	Entiat R	Entiat River
	SU	Steelhead	1999	145,000	4/20/99	4/30/99	Wenatchee R	Wenatchee River
	SU	Chinook	1999	203,000	4/20/99	4/30/99	Turtle Rock H	Mid-Columbia River
	SU	Steelhead	1999	3,000	4/25/99	4/30/99	Turtle Rock H	Mid-Columbia River
Wells	SU	Chinook	1999	589,900	4/5/99	4/26/99	Similkameen Acclim Pd	Okanogan River
	SU	Chinook	1999	410,000	4/12/99	4/19/99	Wells H	Mid-Columbia River
	SU	Steelhead	1999	50,000	4/15/99	4/30/99	Okanogan R	Okanogan River
	SU	Steelhead	1999	250,000	4/15/99	5/5/99	Methow R	Methow River
	SU	Steelhead	1999	236,000	4/15/99	5/5/99	Wells H	Mid-Columbia River
	SU	Steelhead	1999	118,500	4/20/99	4/30/99	Chewuch R	Methow River
	SU	Steelhead	1999	100,000	4/20/99	5/20/99	Winthrop H	Methow River
	SU	Steelhead	1999	78,000	4/27/99	5/15/99	Similkameen Acclim Pd	Okanogan River
	Agency Total:				5,718,050			
Warm Spgs Tribe								
Oak Springs	WI	Steelhead	1999	52,000	4/14/99	5/4/99	E Fk Hood R	Hood River
Round Butte	SP	Chinook	1999	40,000	4/8/99	4/21/99	W Fk Hood R	Hood River
	SP	Chinook	1999	55,000	4/8/99	4/21/99	W Fk Hood R	Hood River
Agency Total:				147,000				
Yakima Tribe								
Prosser	FA	Chinook	1999	1,690,000	4/25/99	5/25/99	Prosser Acclim Pd	Yakama River
Agency Total:				1,690,000				
Total Release:				53,091,260				

Hatchery Release Summary
For the Next Two Weeks
From 4/30/99 to 5/14/99

Hatchery	Species..Migration	Year	Released	Begin.....End	Release Site	River Name
IDFG						
Niagara Springs	SU Steelhead	1999	150,000	4/30/99 5/3/99	Little Salmon R	Salmon River
Sawtooth	Sockeye	1999	5,000	5/1/99 5/15/99	Sawtooth H	Salmon River
	Sockeye	1999	5,000	5/1/99 5/1/99	Redfish Lake Cr	Salmon River
	Agency Total:		53,251,260			
ODFW						
Irrigon	SU Steelhead	1999	900	5/5/99 5/7/99	Deer Cr	Grande Ronde River
Li Sheep	SU Steelhead	1999	120,000	5/11/99 5/11/99	L Sheep Acclim Pd	Imnaha River
Wallowa	SU Steelhead	1999	106,750	5/11/99 5/11/99	Wallowa Acclim Pd	Grande Ronde River
	SU Steelhead	1999	106,750	5/12/99 5/26/99	Wallowa Acclim Pd	Grande Ronde River
	Agency Total:		334,400			
USFWS						
Spring Creek	FA Chinook	1999	3,180,000	5/13/99 5/13/99	Spring Creek H	Columbia River
	Agency Total:		3,180,000			
WDFW						
Wells	SU Steelhead	1999	118,500	5/1/99 5/10/99	Twisp R	Methow River
	Agency Total:		118,500			
Yakima Tribe						
Cle Elum Slough	Coho	1999	210,000	5/7/99 5/25/99	Cle Elem Slough	Yakama River
Jack Creek Pond	Coho	1999	240,000	5/7/99 5/25/99	Jack Creek Acclim Pd	Yakama River
Leavenworth	Coho	1999	419,000	5/1/99 5/1/99	Leavenworth H	Wenatchee River
Lost Creek	Coho	1999	320,000	5/7/99 5/25/99	Naches R	Yakama River
Stiles Pond	Coho	1999	182,000	5/7/99 5/25/99	Naches R	Yakama River
	Agency Total:		1,371,000			
	Total Release:		63,419,060			

Two-Week Summary of Passage Indices

Yearling Chinook

Date	Hatchery							Hatchery/Wild Combined			
	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/16/99	392	267	35	200	5,384	2,719	10,683	27	25,742	22,874	1,180
04/17/99	---	538	---	---	4,350	3,529	9,885	29	21,810	24,619	2,438
04/18/99	---	2,610	---	---	4,425	4,861	11,142	94	37,526	25,340	3,004
04/19/99	1,496	440	61	626	19,321	12,020	12,331	108	54,034	24,564	3,726
04/20/99	2,650	21	63	1,199	40,172	17,118	12,510	108	38,339	25,316	3,555
04/21/99	619	45	27	1,548	65,865	29,428	13,296	660	29,300	25,075	36,776
04/22/99	397	93	21	1,590	86,850	38,007	19,632	816	44,505	56,859	18,292
04/23/99	331	146	16	1,027	64,430	61,072	26,998	1,119	51,131	70,942	12,188
04/24/99	---	31	---	---	56,883	60,158	25,459	1,226	38,998	40,200	16,141
04/25/99	---	5	---	---	54,065	42,137	22,082	313	25,564	26,708	15,114
04/26/99	363	0	8	363	55,667	54,052	12,288	453	21,758	48,809	14,378
04/27/99	938	21	9	740	96,977	82,165	19,618	602	21,388	27,191	10,415
04/28/99	---	---	10	---	76,238	124,204	29,549	1,823	27,442	40,816	15,235
04/29/99	---	---	10	---	79,402	---	37,756	1,152	25,955	38,417	12,984
Total:	7,186	4,217	260	7,293	710,029	531,470	263,229	8,530	463,492	497,730	165,426
# Days:	8	12	10	8	14	13	14	14	14	14	14
Average:	898	351	26	912	50,716	40,882	18,802	609	33,107	35,552	11,816

Wild Yearling Chinook

Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)
04/16/99	245	221	31	53	4,091	11,563	4,234
04/17/99	---	377	---	---	3,324	8,540	6,488
04/18/99	---	392	---	---	3,006	9,748	6,497
04/19/99	287	201	77	531	7,008	17,262	4,459
04/20/99	366	16	87	460	16,209	22,597	7,732
04/21/99	112	19	50	522	16,261	29,714	7,666
04/22/99	128	38	71	580	14,676	30,058	9,215
04/23/99	61	118	74	453	23,244	31,756	8,924
04/24/99	---	38	---	---	20,191	29,914	8,979
04/25/99	---	3	---	---	16,979	17,437	5,896
04/26/99	59	0	24	78	18,556	16,626	3,691
04/27/99	182	12	38	230	34,128	28,136	6,455
04/28/99	---	---	23	---	20,612	47,775	6,375
04/29/99	---	---	17	---	21,835	---	13,802
Total:	1,440	1,435	492	2,907	220,120	301,126	100,413
# Days:	8	12	10	8	14	13	14
Average:	180	120	49	363	15,723	23,164	7,172

Wild Subyearling Chinook

	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)
04/16/99	0	0	0
04/17/99	0	0	0
04/18/99	0	0	0
04/19/99	33	0	0
04/20/99	146	0	0
04/21/99	0	0	0
04/22/99	0	0	0
04/23/99	0	0	0
04/24/99	217	0	0
04/25/99	0	0	0
04/26/99	571	0	0
04/27/99	0	0	0
04/28/99	0	0	0
04/29/99	0	---	0
Total:	967	0	0
# Days:	14	13	14
Average:	69	0	0

The data presented in the following passage index section is preliminary and has been derived from various sources. For verification and/or origin of data, contact the operators of the Fish Passage Data System at (503) 230-4099.

Smolt indices, wild & hatchery or combined, are presented in the following order: yearling chinook (chinook 1's), subyearling chinook (chinook 0's), steelhead, coho, and sockeye. Two classes of fish counts are shown in these tables: collection counts, which account for sample rates but are not adjusted for flow; and passage indices, which are collection counts divided by the proportion of water passing through the sampling system. Collection counts may be constrained due to sampling effort or river flow. 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 hour period that spans two calendar days. In this report, the date shown corresponds with the sample end date.

Two-Week Summary of Passage Indices

Date	Hatchery Subyearling Chinook							Combined Subyearling Chinook			
	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/16/99	0	0	0	0	0	0	0	178	3,982	60	47
04/17/99	---	0	---	---	0	0	0	318	3,199	0	58
04/18/99	---	0	---	---	0	0	0	112	2,075	74	55
04/19/99	0	0	0	0	0	0	0	66	2,830	121	68
04/20/99	0	0	0	0	0	0	0	32	1,792	150	38
04/21/99	0	0	0	0	0	0	0	70	2,956	38	1,078
04/22/99	0	0	0	0	0	0	0	26	787	414	7,080
04/23/99	0	0	0	0	0	0	0	15	1,978	135	19,367
04/24/99	---	0	---	---	0	0	0	17	4,565	0	5,464
04/25/99	---	0	---	---	0	0	0	15	3,091	56	1,619
04/26/99	0	0	0	0	0	0	0	6	3,552	103	1,928
04/27/99	0	0	0	0	0	0	0	7	1,089	777	1,340
04/28/99	---	---	0	---	0	0	0	3	1,106	190	1,012
04/29/99	---	---	0	---	0	---	0	3	1,798	342	947
Total:	0	0	0	0	0	0	0	868	34,800	2,460	40,101
# Days:	8	12	10	8	14	13	14	14	14	14	14
Average:	0	0	0	0	0	0	0	62	2,486	176	2,864

Date	All Coho										
	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/16/99	0	0	0	0	0	0	0	0	0	229	1,274
04/17/99	---	0	---	---	0	0	0	5	0	62	864
04/18/99	---	0	---	---	0	0	0	3	0	233	961
04/19/99	0	0	0	0	0	0	0	2	0	131	960
04/20/99	0	0	0	2	0	0	36	0	0	323	1,270
04/21/99	0	0	0	2	0	0	0	4	0	1,231	7,578
04/22/99	0	0	0	0	201	0	0	6	0	2,344	1,565
04/23/99	0	0	0	0	0	179	56	9	109	3,539	1,513
04/24/99	---	0	---	---	0	181	0	19	95	2,513	1,849
04/25/99	---	0	---	---	0	177	0	19	182	1,354	3,031
04/26/99	0	0	0	3	0	525	0	21	0	4,214	3,574
04/27/99	0	0	0	5	0	694	0	24	105	2,489	1,901
04/28/99	---	---	0	---	0	878	0	26	166	5,115	3,037
04/29/99	---	---	0	---	744	---	0	35	120	6,670	3,251
Total:	0	0	0	12	945	2,634	92	173	777	30,447	32,628
# Days:	8	12	10	8	14	13	14	14	14	14	14
Average:	0	0	0	2	68	203	7	12	56	2,175	2,331

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) }

Two-Week Summary of Passage Indices

Hatchery Steelhead

Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/16/99	57	557	26	11	15,348	5,180	2,280	1	1,082	1,192	514
04/17/99	---	838	---	---	9,831	8,940	1,673	10	1,080	629	557
04/18/99	---	175	---	---	6,958	8,686	4,975	2	2,034	1,251	519
04/19/99	89	309	142	63	12,804	10,822	5,210	10	3,032	927	373
04/20/99	47	53	381	233	17,979	12,610	8,097	4	2,501	3,879	609
04/21/99	14	64	713	277	44,685	19,976	8,744	15	2,061	2,546	2,711
04/22/99	47	123	570	185	65,138	19,243	10,817	25	2,697	2,870	956
04/23/99	28	112	81	165	101,947	22,039	11,338	37	4,519	4,343	1,032
04/24/99	---	9	---	---	125,707	31,091	9,888	43	7,990	3,518	757
04/25/99	---	1	---	---	60,768	28,935	9,827	49	7,546	2,471	1,204
04/26/99	31	0	131	48	62,804	66,051	14,249	46	6,929	7,542	1,406
04/27/99	19	41	415	140	103,390	40,883	16,516	126	7,633	5,373	821
04/28/99	---	---	128	---	94,863	71,397	20,417	128	6,029	7,959	1,302
04/29/99	---	---	95	---	121,087	---	24,410	117	3,955	9,236	1,636
Total:	332	2,282	2,682	1,122	843,309	345,853	148,441	613	59,088	53,736	14,397
# Days:	8	12	10	8	14	13	14	14	14	14	14
Average:	42	190	268	140	60,236	26,604	10,603	44	4,221	3,838	1,028

Wild Steelhead

Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/16/99	3	8	5	3	769	815	456	3	513	313	164
04/17/99	---	17	---	---	601	662	329	10	499	197	278
04/18/99	---	59	---	---	709	533	508	22	415	540	508
04/19/99	7	78	82	34	1,375	908	222	40	876	745	327
04/20/99	13	12	192	41	4,471	1,122	365	57	790	3,854	635
04/21/99	5	25	126	36	11,479	2,605	898	67	896	6,090	2,225
04/22/99	20	29	63	40	12,264	5,100	1,946	67	1,742	7,111	1,636
04/23/99	6	42	0	29	24,671	6,578	1,347	141	1,884	8,053	2,072
04/24/99	---	25	---	---	26,270	12,473	2,955	125	2,472	4,774	1,177
04/25/99	---	1	---	---	10,500	10,289	2,428	106	1,727	3,981	1,412
04/26/99	7	0	48	12	12,846	14,852	2,872	119	1,599	7,477	2,490
04/27/99	1	44	54	28	8,834	12,994	3,186	218	1,935	4,885	2,247
04/28/99	---	---	41	---	7,202	13,506	4,480	244	2,876	7,883	1,832
04/29/99	---	---	28	---	11,166	---	4,791	250	1,977	7,668	1,486
Total:	62	340	639	223	133,157	82,437	26,783	1,469	20,201	63,571	18,489
# Days:	8	12	10	8	14	13	14	14	14	14	14
Average:	8	28	64	28	9,511	6,341	1,913	105	1,443	4,541	1,321

Definitions for Smolt Index Counts.

RIS (Index) = Rock Island Dam Second Powerhouse Bypass Trap : Passage Index Counts : Passage Index = Collection Counts / {Powerhouse 2 Flow / (Powerhouses 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) }

BO1 (Index)= Bonneville Dam First Powerhouse Bypass Trap : Passage Index Counts : Passage Index = Collection Counts / {Powerhouse 1 Flow / (Powerhouses 1 & 2 +Flow + Spill)}

Two-Week Summary of Passage Indi-

Hatchery Sockeye											
Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/16/99	0	0	0	0	0	0	0	7	0	0	0
04/17/99	---	0	---	---	0	0	0	7	42	0	0
04/18/99	---	0	---	---	0	0	0	10	83	61	11
04/19/99	0	0	0	0	0	0	0	10	0	0	0
04/20/99	0	0	0	0	0	0	0	5	112	0	25
04/21/99	0	0	0	0	0	0	0	23	179	0	0
04/22/99	0	0	0	0	0	0	0	14	56	0	0
04/23/99	0	0	0	0	0	0	0	73	109	0	0
04/24/99	---	0	---	---	0	0	0	32	190	0	84
04/25/99	---	0	---	---	0	0	0	23	91	5	0
04/26/99	0	0	0	0	0	0	0	36	178	16	0
04/27/99	0	0	0	0	0	0	0	67	104	6	0
04/28/99	---	---	0	---	0	0	0	67	111	14	48
04/29/99	---	---	0	---	0	---	0	72	0	18	0
Total:	0	0	0	0	0	0	0	446	1,255	120	168
# Days:	8	12	10	8	14	13	14	14	14	14	14
Average:	0	0	0	0	0	0	0	32	90	9	12

Wild Sockeye											
Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/16/99	0	0	0	0	70	95	65	5	321	24	12
04/17/99	---	0	---	---	71	45	127	4	208	160	29
04/18/99	---	0	---	---	34	115	127	10	208	331	0
04/19/99	0	0	0	0	33	74	74	6	404	145	0
04/20/99	0	0	0	0	0	136	109	83	560	51	25
04/21/99	0	0	0	0	273	257	299	154	269	158	0
04/22/99	0	0	0	0	201	216	114	154	955	251	32
04/23/99	0	0	0	0	204	198	112	187	1,016	5	0
04/24/99	---	0	---	---	217	398	227	73	1,046	251	0
04/25/99	---	0	---	---	223	208	0	39	727	551	0
04/26/99	0	0	0	0	285	198	0	24	622	478	120
04/27/99	0	0	0	0	490	197	84	170	1,919	206	130
04/28/99	---	---	0	---	497	200	0	2,318	2,932	518	145
04/29/99	---	---	0	---	248	---	228	792	3,356	932	65
Total:	0	0	0	0	2,846	2,337	1,566	4,019	14,543	4,061	558
# Days:	8	12	10	8	14	13	14	14	14	14	14
Average:	0	0	0	0	203	180	112	287	1,039	290	40

LEW and WTB data collected for the FPC by Idaho Dept. of Fish and Game.
 JDA and BO1 data collected for the FPC by National Marine Fisheries Service.
 RIS data collected for the FPC by Chelan Co. PUD/Washington Dept. of Fish and Wildlife.
 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.

Cumulative Adult Passage at Mainstem Dams Through April 29, 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	16,827	505	23,725	89	42,080	474	0	0	0	0	0	0	0	0	0	0	0	0	0
TDA	4,673	154	13,898	79	19,632	158	0	0	0	0	0	0	0	0	0	0	0	0	0
JDA	2,337	30	8,478	29	11,857	120	0	0	0	0	0	0	0	0	0	0	0	0	0
MCN	938	14	6,189	27	8,344	90	0	0	0	0	0	0	0	0	0	0	0	0	0
IHR	178	5	3,047	6	3,365	17	0	0	0	0	0	0	0	0	0	0	0	0	0
LMN	22	2	1,702	2	2,304	17	0	0	0	0	0	0	0	0	0	0	0	0	0
LGS	43	1	996	2	**	**	0	0	0	0	**	**	0	0	0	0	**	**	**
LWG	19	1	831	2	940	4	0	0	0	0	0	0	0	0	0	0	0	0	0
PRD	84	0	636	0	776	2	0	0	0	0	0	0	0	0	0	0	0	0	0
RIS	4	0	85	0	184	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RRH	3	5	10	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

DAM	Coho						Sockeye			Steelhead				
	1999		1998		10-Yr Avg.		10-Yr Avg.			10-Yr			Wild	Wild
	Adult	Jack	Adult	Jack	Adult	Jack	1999	1998	Avg.	1999	1998	Avg.	1999	1998
BON	0	0	0	0	0	0	0	0	0	1,155	1,338	2,410	191	285
TDA	0	0	0	0	0	0	0	0	0	245	604	1,328	76	168
JDA	0	0	0	0	0	0	0	0	0	2,516	4,318	2,532	633	1,219
MCN	0	0	1	0	0	0	0	0	0	240	1,229	2,115	58	401
IHR	0	0	0	0	0	0	0	0	0	721	1,705	2,556	255	486
LMN	0	0	0	0	0	0	0	0	0	529	1,491	2,228	99	430
LGS	0	0	0	0	**	**	0	0	**	824	1,906	**	265	575
LWG	0	0	0	0	0	0	0	0	0	2,940	4,207	5,414	476	737
PRD	0	0	0	0	0	0	3	0	0	3	6	19	0	0
RIS	2	0	0	0	0	0	0	0	0	15	18	43	0	0
RRH	6	0	0	0	0	0	0	0	0	25	69	33	0	0
WEL	---	---	---	---	---	---	---	---	---	---	---	---	---	---

*PRD, RIS, RRH are through 04/28/99.

*WEL is not sampling yet.

*Bonneville and Lower Granite were doing video counts only until April 1, 1999. These counts were 8 hour daytime video counts.

**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.

*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.

*NOTE: PRD, RIS, and RRH, are not reporting Wild Steelhead numbers.

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

**Transportation Summary Report
Two-Week Transportation Summary
from 04/16/99 to 04/29/99**

	Yearling Chinook	Subyearling Chinook	Steelhead	Coho	Sockeye	Total
LOWER GRANITE DAM						
Collected	608,990	570	638,520	600	1,820	1,250,500
Bypassed	34,463	0	16,085	2	0	50,550
Trucked	0	0	0	0	0	0
Barged	575,922	570	630,243	594	1,807	1,209,136
Total Transported	575,922	570	630,243	594	1,807	1,209,136
LITTLE GOOSE DAM						
Collected	683,896	0	354,280	2,254	1,883	1,042,313
Bypassed	0	0	0	0	0	0
Trucked	0	0	0	0	0	0
Barged	689,120	0	357,732	2,250	1,663	1,050,765
Total Transported	689,120	0	357,732	2,250	1,663	1,050,765
LOWER MONUMENTAL DAM						
Collected	311,580	0	151,680	80	1,325	464,665
Bypassed	734	0	209	0	0	943
Trucked	0	0	0	0	0	0
Barged	323,888	0	153,108	80	1,439	478,515
Total Transported	323,888	0	153,108	80	1,439	478,515
M McNARY DAM						
Collected	283,780	21,500	45,557	422	8,851	360,110
Bypassed	283,657	21,491	45,547	422	8,849	359,966
Trucked	0	0	0	0	0	0
Barged	0	0	0	0	0	0
Total Transported	0	0	0	0	0	0
PROJECT TOTALS						
Collected	1,888,246	22,070	1,190,037	3,356	13,879	3,117,588
Bypassed	318,854	21,491	61,841	424	8,849	411,459
Trucked	0	0	0	0	0	0
Barged	1,588,930	570	1,141,083	2,924	4,909	2,738,416
Total Transported	1,588,930	570	1,141,083	2,924	4,909	2,738,416

**Transportation Summary Report
Cumulative Transportation Summary
through 04/29/99**

	Yearling Chinook	Subyearling Chinook	Steelhead	Coho	Sockeye	Total
LOWER GRANITE DAM						
Collected	662,696	716	706,892	807	3,358	1,374,469
Bypassed	36,243	0	18,040	3	0	54,286
Trucked	29,736	126	23,030	183	1,219	54,294
Barged	592,644	590	665,534	614	1,984	1,261,366
Total Transported	622,380	716	688,564	797	3,203	1,315,660
LITTLE GOOSE DAM						
Collected	714,804	0	375,244	2,265	2,542	1,094,855
Bypassed	0	0	0	0	0	0
Trucked	1,001	0	1,128	5	120	2,254
Barged	710,549	0	373,926	2,255	2,167	1,088,897
Total Transported	711,550	0	375,054	2,260	2,287	1,091,151
LOWER MONUMENTAL DAM						
Collected	361,768	7	159,663	95	1,774	523,307
Bypassed	888	0	322	0	0	1,210
Trucked	3,464	6	899	0	28	4,397
Barged	355,620	0	158,182	95	1,678	515,575
Total Transported	359,084	6	159,081	95	1,706	519,972
M McNARY DAM						
Collected	510,920	38,748	99,227	612	9,432	658,939
Bypassed	509,949	38,709	99,207	612	9,430	657,907
Trucked	0	0	0	0	0	0
Barged	0	0	0	0	0	0
Total Transported	0	0	0	0	0	0
PROJECT TOTALS						
Collected	2,250,188	39,471	1,341,026	3,779	17,106	3,651,570
Bypassed	547,080	38,709	117,569	615	9,430	713,403
Trucked	34,201	132	25,057	188	1,367	60,945
Barged	1,658,813	590	1,197,642	2,964	5,829	2,865,838
Total Transported	1,693,014	722	1,222,699	3,152	7,196	2,926,783