



Fish Passage Center

Weekly Report #99 - 9

May 7, 1999

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SUMMARY OF EVENTS:

Precipitation: The Northwest River Forecast Center has changed their schedule for summarizing the past week's Columbia precipitation. Instead of being available on Wednesday of each week, it will now be updated every Friday. However, that update will not be available in time to be included in our weekly report. Beginning next week we will provide you with the precipitation data summaries for the week ending the Friday before publication of our report.

System Storage:

Hungry Horse was drafted below the end of April flood control elevation for maintenance work. The reservoir continues to be operated with minimum outflow during the weekend and 4.8 Kcfs during weekdays.

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 the January through February period. It is projected that the reservoir will be nearly 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 the April-May period. This operation and low precipitation continues to affect inflows to Grand Coulee.

Grand Coulee draft from 1222.3 ft on April 28 to 1219.6 ft. on May 6. The reservoir operated during the past week with an outflow in the range of 140.0 Kcfs-163.0 Kcfs.

Dworshak reservoir continues to have variable, but generally higher inflows due to local snow-melt. The reservoir elevation is increasing. Currently the reservoir is operated at 8 Kcfs (powerhouse

capacity is 10 Kcfs), dropping from 14 Kcfs on May 3.

Brownlee reservoir was drafted to its end of April flood control elevation. The project passed inflow through the past week. It is expected to decrease outflow at Hells Canyon Dam to reduce spill at this project in response to concern over total dissolved gas levels below this project.

A summary of the current elevations at midnight May 6 relative to the end of April flood control elevations are given in the following Table:

Reservoir	Actual elev. As of May 6 [ft]	Max Reservoir pool [ft]	End of April Flood Control Elev. [ft]
Libby	2343.93	2459	2339.8
Hungry Horse	3491.68	3560	3491.0
Grand Coulee	1219.70	1290	1220.2
Brownlee	1990.50*	2077	1990.0
Dworshak	1456.23	1600	1445.0

* as of May 4

Upper Snake reservoirs:

Currently all reservoirs continue to be operated for flood control. As of May 6, BOR continues to operate American Falls to 95% of full, passing inflow. Palisades is 32% of full. Colder weather and decreasing precipitation in the region resulted in lower flows at Milner this past week.

Boise and Payette River Basins:

The Boise River system (Anderson Ranch, Arrowrock and Lucky Peak) is presently ahead of its flood control rule curve. The Payette River system (Cascade, Deadwood) is slightly above 50% of capacity.

Streamflow: The Biological Opinion spring flow target based on the April Final Runoff Volume Forecast is 100 Kcfs at Lower Granite Dam and 260 Kcfs at McNary Dam. 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 snow-melt 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, and only exceeded the targets the last week of April. Due to the continued cold weather average weekly flow are barely higher than the Biological Opinion Target at Lower Granite, and are currently higher than required by BiOp minimum flow targets at McNary Dam.

Flows at Priest Rapids exceeded the BiOp target flows of 135 Kcfs, fluctuating from 167.4 Kcfs to 197.5 Kcfs during the April 30 to May 6 period. 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 30	197.5	186.1-205.5
May 1	181.5	167.1-203.5
May 2	181.2	171.5-190.4
May 3	187.4	170.4-206.1
May 4	196.1	179.7-218.0
May 5	182.2	167.7-189.2
May 6	167.4	159.9-186.0

At Priest Rapids, McNary and Bonneville dams the flows were about the same as last week, exhibiting only minor increases or decreases. However, the average flows at Lower Granite Dam were almost 13 Kcfs lower. On two days during the past week the flows were below the Biological Opinion flow target. On May 6, 1999 the flow at Lower Granite was 98.2 Kcfs, while the outflow at Dworshak was only 8 Kcfs. The average discharge for the major run of river projects for April 30 through May 6 period are given in the following Table:

Project	Average Discharge [Kcfs]	
	April 23-29	April 30-May 6
<i>Priest Rapids</i>	179.8	184.8
<i>McNary</i>	302.01	296.5
<i>Lower Granite</i>	114.4	101.8
<i>Bonneville</i>	318.3	317.4

Spill: Outflow from Dworshak Dam continued at 14 Kcfs, with spill occurring above hydraulic capacity (approximately 3.6 Kcfs spill), until May 4 when outflow was decreased below hydraulic capacity. Spill occurred at the Hells Canyon complex due to high inflows to Brownlee. Presently, those flows are being lower. The Biological Opinion spill program is presently being implemented at the lower Snake projects. Spill is being adjusted to the spill caps when conditions warrant a change.

The COE visited the Ice Harbor tailrace monitor site last Wednesday to correct the problem identified with the standpipe. Apparently, the monitor sensor was much higher in the standpipe than the holes where water flows through. The problem was corrected. Present spill levels (to the 120%) will continue and next week the data collected from the fixed tailrace monitor will be compared to the transect information to assess the ability of this monitor to represent tailrace conditions.

The FERC spill program continues at the Mid Columbia projects.

Biological Opinion spill levels continue at the lower Columbia projects. Spill at McNary is primarily in excess of hydraulic capacity. Spill at The Dalles Dam alternated 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. This has been a week of peak hatchery steelhead passage at Lower Granite Dam. After averaging approximately 155,000 fish/day during the first five days of this week, the daily passage index of hatchery steelhead jumped to slightly over 430,000 fish during the 24-hr period ending 07:00 May 5 before falling back to just under 100,000 fish on May 6. This week's daily passage indices of wild steelhead were within the 4,000-16,000 range and those of wild chinook were within the 9,000-21,000 range, while coho and sockeye passage indices remained well below 500 fish each day. The 1999 passage timing of

wild and hatchery steelhead and wild chinook continues to be fairly close to the historic average timing distribution at Lower Granite Dam. The hatchery yearling chinook passage timing at Lower Granite Dam, on the other hand, now appears nearly two weeks later than the historic average timing distribution. On only three days during this week did the hatchery chinook daily passage indices exceed 100,000 fish. As of May 6, the cumulative hatchery chinook cumulative passage index at Lower Granite Dam is only about one-third of our projection for the season.

In the Mid-Columbia River, the Rock Island Dam passage indices of yearling chinook (combined hatchery/wild fish) have remained above 1,000 fish per day. As of May 6, the yearling chinook passage timing at Rock Island Dam appears well ahead of the historic average timing distribution. Yearling chinook dominated the collections at Rock Island Dam followed (in decreasing order) by wild sockeye, wild steelhead, hatchery steelhead, total coho, and lastly hatchery sockeye.

In the lower Columbia River, yearling chinook (combined hatchery/wild fish) dominate the collections at McNary, John Day, and Bonneville dams. Yearling chinook passage indices at John Day and Bonneville didn't change much during the week, while those at McNary Dam nearly tripled from levels below 35,000 fish during the first several days of this week to above 93,000 fish by week's end. Next to yearling chinook, wild sockeye were the next most abundant species in the collections at McNary Dam by the end of this week. Daily passage indices of wild sockeye grew from less than 5,000 fish at the start of the week to over 36,000 fish by the end of the week. Increases in passage indices of total coho and hatchery steelhead were also observed this week at the lower Columbia River dams. Wild steelhead passage indices doubled the last two days of this week at McNary Dam, but remained relatively unchanged over the past two weeks at John Day and Bonneville dams.

Adult Fish Passage: At Bonneville Dam, daily passage counts of adult spring chinook ranged from a low of 1,100 on May 6 to a high of 1,438 on May 4 for the week of April 30 to May 6. The season total was 25,796, and remained below the 1998 count (30,218) and the 10-year average count (52,125). Of the chinook past Bonneville, 8,721 have been reported at The Dalles Dam, 5,055 at John Day Dam, and 2,633 at McNary Dam. Through May 6, a total of 673 adult spring chinook were counted at the lower Snake River dam (Ice Harbor) with 110 adult spring chinook counted at Lower Granite Dam to date. In the Mid-Columbia River, 534 adult spring chinook have been counted at Priest Rapids Dam. At Wells Dam, all spring chinook will be captured at trapping facilities located on West and East bank fish ladders. Steelhead will be released back into the ladder to continue upstream while the chinook will be taken to hatcheries for holding until spawning. The spring chinook trapping is tentatively slated to continue through the first week of July.

The number of jack chinook salmon passing Bonneville Dam was 1,876; this total compares to only 228 jacks in 1998 and 1,010 for the 10-year average. This return of jack spring chinook is very encouraging and could result in increased adult returns during the upcoming two years.

At Bonneville Dam, the daily passage of steelhead was about 20 fish per day for the past week, with the cumulative count for the season at 1,299. Of this total, 17% or 220 were "wild" origin steelhead. At Lower Granite Dam, steelhead passage since March 1 totaled 3,002, about 70% and 54% of the respective 1998 and 10-year average (spring passage only). Of the total, 519 were recorded as being "wild" steelhead (about 17% of the run).

Hatchery Releases: During the past two weeks, approximately 15.9 million anadromous salmon were released from hatcheries, acclimation ponds, or were directly planted into streams. For the upcoming two weeks, about 4.7 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. Large numbers of steelhead and coho releases were planted through the past two weeks and releases will continue through mid to late May. Subyearling bright fall chinook will be released from late May through late June.

Lower Columbia River (above Bonneville Dam to McNary Dam) – Yearling spring chinook from hatcheries and acclimation ponds are completed for the 1999 migration year. Also, steelhead releases were completed in the Umatilla, Hood, and Deschutes, White Salmon and Klickitat rivers. The third release of subyearling fall chinook (about 3.2 million) from Spring Creek NFH is scheduled for May 13, 1999. The coho releases are nearly complete for the year as well.

Mid-Columbia River - Yearling spring chinook have been released in the Wenatchee, Methow, Entiat River basins through the end of the month. Two new facilities in the upper Yakama basin released spring chinook this season on a volitional release basis. 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 were released this next week with additional scheduled in two weeks. 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 completed for the 1999 migration

season. Both volitional and direct stream releases have been used from the hatcheries. Several million steelhead were released from hatcheries and acclimation ponds during the past two weeks with releases continuing through the next two weeks. Yearling fall chinook were released during the spring and are complete for the season. Subyearling fall chinook will be released in June from Big Canyon (Clearwater drainage), CPT John (Snake R) and from Lyons Ferry H (direct plant). Coho releases are also completed for the 1999 migration season. Sockeye (Red Fish Lake stock) were released during the past week.

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
04/23/99	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
04/30/99	163.0	0.0	164.2	0.0	172.7	10.4	178.4	27.9	184.0	41.0	183.0	36.6	197.5	158.8
05/01/99	145.9	0.0	154.2	0.0	168.2	10.4	167.3	28.3	177.4	40.9	168.1	33.8	181.5	144.8
05/02/99	152.6	0.0	157.1	0.0	167.3	10.4	171.6	26.5	176.6	41.1	169.3	33.9	181.2	144.6
05/03/99	161.6	0.0	163.9	0.0	176.7	10.4	175.2	22.5	184.1	41.0	174.4	34.9	187.4	147.9
05/04/99	146.3	0.0	153.8	0.0	170.0	10.4	174.5	27.3	177.3	41.0	178.7	35.7	196.1	145.4
05/05/99	140.0	0.0	147.6	0.0	157.4	10.0	161.1	27.4	166.3	41.0	165.1	33.8	182.2	137.6
05/06/99	153.0	0.0	151.6	0.0	161.0	10.0	162.8	26.9	165.7	41.1	155.6	31.6	167.4	126.2

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

Date	Dworshak		Brownlee Canyon		Hells Granite		Lower Granite		Little Goose		Lower Monumental		Ice Harbor	
	Flow	Spill	Inflow	Outflow	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
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	35.4	38.7	108.9	34.4	99.2	17.2	102.2	14.8	108.9	68.6		
04/30/99	10.9	0.6	34.1	35.3	100.2	33.5	97.2	20.5	102.1	16.6	104.3	65.7		
05/01/99	14.0	3.7	32.4	33.3	98.7	34.5	95.4	19.3	97.4	17.6	100.1	66.2		
05/02/99	14.1	3.7	32.2	32.3	102.2	34.4	101.2	17.5	106.0	16.9	108.4	72.6		
05/03/99	14.0	3.7	34.3	35.1	103.8	34.5	99.5	17.2	102.3	15.6	106.9	69.5		
05/04/99	10.1	0.0	37.6	39.7	109.1	34.2	106.5	18.5	113.7	15.7	116.4	71.3		
05/05/99	7.9	0.0	---	39.5	100.7	34.2	94.5	20.3	98.1	15.3	103.4	71.4		
05/06/99	8.0	0.0	---	---	98.2	34.6	94.5	21.1	102.1	19.4	105.4	72.1		

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

Date	McNary		John Day		The Dalles		Bonneville			
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	PH1	PH2
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	203.4	335.2	139.4	75.7	110.9
04/30/99	309.8	143.0	314.6	89.8	314.4	196.0	330.8	110.2	85.4	126.1
05/01/99	282.5	129.1	306.4	111.2	302.1	111.0	309.1	96.2	82.2	121.5
05/02/99	298.9	140.9	313.1	111.0	307.8	92.0	307.5	94.0	82.8	121.5
05/03/99	304.6	138.9	307.0	105.1	298.9	90.0	322.3	97.5	82.4	133.2
05/04/99	298.9	134.8	323.2	98.1	313.1	178.0	324.6	97.2	82.9	135.3
05/05/99	294.7	135.3	315.1	104.6	314.0	192.0	315.0	95.1	82.4	128.3
05/06/99	286.2	122.6	282.5	68.3	287.1	174.0	312.4	97.5	80.0	125.7

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>Tlwr C. Joseph</u>				<u>Wells</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>	#	<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	Avg	Avg	High	hr
4/23	113	116	116	24	109	109	111	24	106	107	107	24	104	104	104	1	112	116	124	22	104	104	105	11
4/24	116	116	117	24	110	111	112	24	107	108	108	24	---	---	---	0	109	110	132	17	---	---	---	0
4/25	117	119	121	24	111	112	112	24	108	108	109	24	---	---	---	0	110	110	111	23	---	---	---	0
4/26	119	120	121	24	109	110	111	24	107	107	108	24	---	---	---	0	109	109	110	23	107	107	107	15
4/27	117	118	118	24	109	110	112	24	107	107	107	24	---	---	---	0	108	108	109	23	107	107	107	24
4/28	116	118	118	24	108	108	109	24	106	107	107	24	---	---	---	0	107	107	107	7	106	106	107	24
4/29	117	118	119	24	108	108	110	24	106	106	107	24	---	---	---	0	107	108	109	23	106	106	107	24
4/30	---	---	---	0	109	109	110	23	106	107	107	23	106	106	107	2	108	109	110	23	107	107	107	23
5/1	---	---	---	0	109	110	111	24	107	108	108	24	---	---	---	0	109	110	111	23	108	108	108	24
5/2	---	---	---	0	109	109	110	24	107	108	108	24	---	---	---	0	109	110	111	23	107	108	108	24
5/3	---	---	---	0	109	110	111	24	107	108	108	24	---	---	---	0	109	110	111	23	108	108	108	13
5/4	118	118	118	24	108	108	109	24	106	106	107	24	106	107	107	23	109	109	109	7	107	107	108	15
5/5	117	118	119	24	107	107	108	24	104	105	105	24	105	105	105	23	---	---	---	0	105	105	106	11
5/6	118	118	119	24	108	109	109	24	106	106	107	24	106	106	107	23	---	---	---	0	---	---	---	0

Total Dissolved Gas Saturation Data at Mid Columbia Sites

Date	<u>Rocky Reach</u>			<u>Tlwr. Rocky R.</u>				<u>Rock Island</u>				<u>Tlwr Rock Is.</u>				<u>Wanapum</u>				<u>Dnstrm Wanapum</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>	#	<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	Avg	Avg	High	hr
4/23	107	108	109	23	112	113	114	18	107	108	108	21	117	117	118	18	111	113	114	24	116	117	118	24
4/24	109	109	110	23	115	116	117	22	109	110	111	24	119	119	120	24	114	116	119	24	119	119	120	24
4/25	109	109	110	22	118	118	119	21	110	110	110	22	119	119	120	20	114	115	115	24	119	120	121	24
4/26	109	109	109	20	120	120	122	13	109	109	109	19	117	118	119	16	112	112	113	24	118	119	121	24
4/27	109	109	109	21	116	120	122	19	109	110	110	21	117	118	118	19	112	112	115	24	118	118	121	24
4/28	109	109	109	21	111	112	113	20	111	111	112	21	118	118	119	17	112	112	113	24	117	117	118	24
4/29	109	110	110	22	111	112	113	21	111	111	112	21	119	119	120	18	112	113	113	24	117	117	118	24
4/30	109	109	110	22	110	111	112	20	110	111	111	22	118	119	120	20	114	115	116	24	119	119	121	24
5/1	110	110	110	20	111	111	112	20	111	111	111	22	119	119	119	22	---	---	---	0	120	121	123	24
5/2	110	110	110	22	111	111	111	22	111	111	112	23	119	119	119	22	---	---	---	0	119	119	121	24
5/3	110	110	111	20	110	111	111	20	110	111	111	21	118	118	119	18	113	113	114	12	119	119	120	24
5/4	107	108	109	22	109	110	111	18	108	109	109	19	117	117	118	19	111	111	112	24	116	117	118	24
5/5	106	106	106	23	108	108	109	22	107	108	109	24	117	117	118	24	109	109	110	24	115	116	116	24
5/6	107	108	108	24	109	109	111	19	108	109	110	21	118	118	118	18	---	---	---	0	---	---	---	0

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

Date	<u>Priest Rapids</u>			<u>Dwnstr P. Rapids</u>				<u>Dworshak</u>				<u>Clearwater</u>				<u>Anatone</u>				<u>Snake-Lewiston</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>	#	<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	Avg	Avg	High	hr
4/23	112	114	116	24	121	122	122	24	109	109	110	24	105	106	107	23	---	---	---	0	104	106	107	24
4/24	115	116	119	24	122	122	123	24	109	110	110	24	105	106	107	24	---	---	---	0	104	106	107	24
4/25	116	117	117	24	121	121	122	24	110	110	110	24	105	106	106	24	---	---	---	0	104	105	106	24
4/26	115	115	115	24	121	121	122	24	109	110	110	24	104	105	105	24	---	---	---	0	103	104	104	24
4/27	114	115	115	24	121	121	121	24	109	109	110	24	104	104	105	24	---	---	---	0	103	104	104	24
4/28	114	114	115	24	121	122	122	24	109	109	109	24	103	103	104	23	105	105	106	24	102	102	102	24
4/29	114	115	116	24	122	123	123	24	107	108	109	23	104	104	105	23	104	105	105	24	103	104	104	23
4/30	116	118	118	24	122	122	123	24	103	105	109	24	103	104	106	24	106	107	108	23	103	104	105	23
5/1	117	117	118	24	122	122	122	24	109	110	110	24	104	105	105	24	105	105	106	24	103	104	104	24
5/2	117	117	118	24	122	122	122	24	110	110	110	24	104	105	105	24	105	105	106	24	103	104	105	24
5/3	115	116	116	24	122	122	122	24	110	110	110	10	105	105	105	10	104	105	105	24	103	103	103	10
5/4	114	115	116	24	121	121	121	24	103	103	105	24	101	102	104	23	104	105	105	24	101	101	102	24
5/5	113	113	115	24	121	121	122	24	101	102	102	24	102	102	103	23	106	107	107	24	102	103	104	24
5/6	---	---	---	0	---	---	---	0	102	103	104	24	103	104	105	24	107	108	109	24	103	105	106	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>Lower Granite</u>			<u>Tlwr L. Granite</u>			<u>Little Goose</u>			<u>Tlwr L. Goose</u>			<u>Lower Mon.</u>			<u>Tlwr L. Mon</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	Avg					
4/23	105	106	107	24	112	118	119	24	111	114	116	24	113	116	117	24	114	115	116	23	116	117	118	24
4/24	108	109	110	24	113	118	119	24	113	114	119	24	114	116	117	24	115	116	118	24	116	116	118	24
4/25	108	109	109	15	115	120	122	24	114	116	118	24	113	115	116	24	115	117	118	24	115	117	118	24
4/26	106	106	106	24	116	119	121	24	113	115	116	24	113	114	115	24	113	114	114	24	113	116	117	24
4/27	105	105	107	24	117	120	122	24	114	116	118	24	114	115	116	24	113	113	114	24	114	116	118	24
4/28	104	104	105	24	117	120	121	24	113	114	116	24	115	116	117	23	113	113	114	23	114	116	117	24
4/29	104	104	105	24	112	118	121	24	114	115	116	22	114	116	118	24	115	116	117	24	114	115	117	24
4/30	105	106	107	24	113	119	122	23	114	115	116	17	116	118	119	23	115	116	117	24	116	118	119	23
5/1	105	106	106	24	113	120	121	24	---	---	---	0	115	117	119	24	117	118	119	24	117	119	120	24
5/2	106	107	107	24	114	120	121	24	---	---	---	0	114	116	117	24	115	116	116	24	115	117	118	24
5/3	106	106	106	9	117	117	122	9	112	112	112	3	115	115	117	10	113	113	114	9	116	116	118	9
5/4	103	104	104	24	113	119	121	24	109	109	111	13	112	116	117	24	110	111	112	24	114	117	120	24
5/5	102	102	103	24	112	119	120	24	107	108	111	16	112	117	117	24	109	110	111	24	113	115	119	24
5/6	103	105	106	24	112	118	119	24	---	---	---	0	113	117	118	24	112	115	118	24	117	119	120	24

Total Dissolved Gas Saturation Data at Lower Columbia Sites

Date	<u>Ice Harbor</u>			<u>Tlwr Ice Harbor</u>			<u>Pasco</u>			<u>McNary-Oregon</u>			<u>McNary-Wash</u>			<u>Tlwr McNary</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	Avg					
4/23	115	116	117	24	116	118	120	24	---	---	---	0	111	113	115	24	110	110	111	24	121	121	123	24
4/24	116	117	118	24	115	117	118	24	---	---	---	0	113	115	118	24	112	114	116	24	120	121	122	24
4/25	115	115	115	24	114	116	117	24	---	---	---	0	114	114	115	24	115	116	117	24	121	122	123	24
4/26	113	113	114	24	114	115	116	24	---	---	---	0	114	114	114	24	114	114	115	24	119	120	121	24
4/27	112	112	112	14	115	116	117	14	---	---	---	0	112	113	114	24	112	113	114	24	120	120	121	24
4/28	112	112	113	24	116	118	119	24	---	---	---	0	112	112	113	24	112	113	114	24	121	122	123	24
4/29	112	113	113	24	115	117	118	24	---	---	---	0	113	114	115	24	113	115	115	24	121	121	121	24
4/30	114	115	117	24	114	115	116	23	---	---	---	0	116	118	121	23	116	118	119	24	121	121	121	24
5/1	116	116	116	24	112	114	116	24	---	---	---	0	116	116	116	24	117	117	118	24	121	121	121	24
5/2	114	114	115	24	113	114	116	24	---	---	---	0	115	115	115	24	114	114	115	24	121	121	121	24
5/3	114	114	114	13	115	115	117	13	---	---	---	0	113	113	114	9	112	112	113	9	121	121	121	9
5/4	110	111	112	24	113	114	116	24	---	---	---	0	109	109	110	24	108	109	110	24	120	120	121	24
5/5	109	110	111	24	117	119	121	21	---	---	---	0	109	110	112	24	108	110	111	24	120	120	120	24
5/6	112	113	116	24	117	120	121	24	---	---	---	0	110	112	113	24	112	114	115	24	119	120	120	24

Total Dissolved Gas Saturation Data at Lower Columbia Sites

Date	<u>John Day</u>			<u>Tlwr John Day</u>			<u>The Dalles</u>			<u>Dnstr T. Dalles</u>			<u>Bonneville</u>			<u>Warrendale</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	Avg					
4/23	107	108	110	23	117	120	120	24	108	109	111	23	117	118	118	24	113	116	117	23	117	119	121	23
4/24	110	111	114	22	116	120	120	24	110	111	112	21	118	118	119	24	118	118	119	23	120	120	121	23
4/25	112	112	113	23	117	120	120	24	110	111	111	23	116	117	119	24	115	116	118	23	118	119	121	23
4/26	112	113	113	23	118	120	120	24	110	111	112	23	114	115	116	24	112	113	114	23	116	117	118	23
4/27	111	111	112	22	119	120	120	24	111	112	113	23	115	116	117	24	112	112	113	23	116	117	118	23
4/28	110	110	110	7	120	120	121	5	109	109	110	7	118	118	119	8	112	112	112	7	118	118	119	7
4/29	110	111	113	23	117	120	121	24	111	112	113	22	119	119	120	24	115	116	116	23	120	121	121	23
4/30	111	111	112	23	118	120	122	24	111	112	113	23	119	120	120	24	117	117	118	23	120	121	121	23
5/1	113	113	114	22	120	121	121	24	112	112	113	23	117	118	120	24	116	116	117	23	118	119	121	19
5/2	114	114	114	23	121	121	121	24	114	115	116	23	117	118	119	24	115	115	115	23	118	119	125	23
5/3	113	113	114	23	120	121	121	24	113	114	114	23	117	118	119	24	114	114	115	23	117	119	119	22
5/4	109	110	111	20	119	120	120	20	110	111	111	21	117	118	119	21	112	112	113	23	116	117	118	22
5/5	108	110	112	23	121	122	123	24	110	111	112	23	118	119	120	24	114	116	117	23	117	118	119	23
5/6	109	110	111	23	116	121	123	23	112	113	114	23	119	119	120	24	117	117	118	23	119	119	120	23

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

Total Dissolved Gas Saturation Data at Lower Columbia Sites

<u>Date</u>	<u>Skamainia</u>				<u>CamasWash.</u>			
	<u>24 h</u>	<u>12 h</u>	<u>High</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>High</u>	<u>#</u>
	<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>		
4/23	116	117	119	23	114	116	117	24
4/24	119	119	120	23	118	120	121	24
4/25	117	118	120	23	117	117	118	24
4/26	115	116	117	23	115	116	117	24
4/27	114	115	116	23	113	114	115	24
4/28	116	116	116	7	113	113	113	8
4/29	118	119	120	23	117	120	121	24
4/30	119	120	121	23	119	120	120	24
5/1	117	118	120	23	117	118	119	24
5/2	116	117	119	23	116	116	117	24
5/3	115	116	118	23	115	115	116	24
5/4	113	114	116	23	113	113	114	24
5/5	115	117	119	23	114	116	117	24
5/6	117	118	119	23	115	116	117	24

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													
	05/03/99	Yearling Chinook	100	2	0	0.00%	0.00%	0	0	0	0	2	1
	05/03/99	Steelhead	100	2	1	1.00%	0.00%	1	0	0	0	1	1
Little Goose Dam													
	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
	05/05/99	Yearling Chinook	100	2	0	0.00%	0.00%	0	0	0	0	2	1
	05/05/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0
Lower Monumental Dam													
	05/03/99	Yearling Chinook	100	3	0	0.00%	0.00%	0	0	0	0	3	1
	05/03/99	Steelhead	100	2	0	0.00%	0.00%	0	0	0	0	2	1
Ice Harbor Dam													
	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
	04/30/99	Yearling Chinook	100	1	1	1.00%	0.00%	1	0	0	0	0	0
	04/30/99	Steelhead	22	1	0	0.00%	0.00%	0	0	0	0	1	1
	05/04/99	Yearling Chinook	100	5	0	0.00%	0.00%	0	0	0	0	5	1
	05/04/99	Steelhead	65	1	0	0.00%	0.00%	0	0	0	0	1	1
McNary Dam													
	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
	05/03/99	Yearling Chinook	100	2	0	0.00%	0.00%	0	0	0	0	2	1
	05/03/99	Steelhead	40	1	0	0.00%	0.00%	0	0	0	0	1	1
	05/06/99	Yearling Chinook	100	5	0	0.00%	0.00%	0	0	0	0	5	1
	05/06/99	Steelhead	73	2	0	0.00%	0.00%	0	0	0	0	2	1
Bonneville Dam													
	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
	05/03/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	05/03/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	05/06/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	05/06/99	Steelhead	100	1	1	1.00%	0.00%	0	1	0	0	0	0
Rock Island Dam													
	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
	05/03/99	Yearling Chinook	100	2	0	0.00%	0.00%	0	0	0	0	2	1
	05/03/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	05/06/99	Yearling Chinook	100	4	2	2.00%	0.00%	2	0	0	0	2	1
	05/06/99	Steelhead	100	2	0	0.00%	0.00%	0	0	0	0	2	1

Hatchery Release Summary
For the Last Two Weeks
From 4/23/99 to 5/06/99

Hatchery	Species...	Migration Year	Number ...Release Dates...			Release Site	River Name	
			Released	Begin	..End			
IDFG								
Clearwater	SU	Steelhead	1999	190,539	4/22/99	4/23/99	Clear Cr	Clearwater Rvr M F
	SU	Steelhead	1999	400,465	4/27/99	4/29/99	S Fk Clearwater R	Clearwater Rvr M F
Magic Valley	SU	Steelhead	1999	329,630	4/16/99	4/26/99	Lemhi R	Salmon River
	SU	Steelhead	1999	132,420	4/21/99	4/23/99	Shoup Br (Salmon R)	Salmon River
	SU	Steelhead	1999	309,092	4/21/99	4/28/99	McNabb/Salmon R	Salmon River
	SU	Steelhead	1999	39,660	4/23/99	4/23/99	Sawtooth H	Salmon River
	SU	Steelhead	1999	100,095	4/27/99	5/15/99	Squaw Cr Acclim Pd	Salmon River
	SU	Steelhead	1999	312,000	4/27/99	5/5/99	Squaw Cr Acclim Pd	Salmon River
	SU	Steelhead	1999	109,145	4/28/99	5/3/99	Salmon R	Salmon River
	SU	Steelhead	1999	268,925	4/29/99	5/5/99	E Fk Salmon R	Salmon River
	SU	Steelhead	1999	12,800	5/6/99	5/6/99	Little Salmon R	Salmon River
Niagara Springs	SU	Steelhead	1999	829,199	4/10/99	4/27/99	Pahsimeroi H	Pahsimeroi River
	SU	Steelhead	1999	171,920	4/28/99	5/1/99	Little Salmon R	Salmon River
Sawtooth	SU	Steelhead	1999	457,084	4/23/99	4/23/99	Sawtooth H	Salmon River
		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:				3,672,974				
Nez Perce Tribe								
Dworshak		Coho	1999	220,000	4/26/99	4/30/99	Clear Cr	Clearwater Rvr M F
	Agency Total:				220,000			
ODFW								
Irrigon	SU	Steelhead	1999	900	5/5/99	5/7/99	Deer Cr	Grande Ronde Rive
	Agency Total:				900			
Umatilla Tribe								
Bonifer	SU	Steelhead	1999	40,000	4/15/99	5/4/99	Bonifer Acclim Pd	Umatilla River
	Agency Total:				40,000			
USFWS								
Dworshak	SU	Steelhead	1999	200,000	4/19/99	4/23/99	Clear Cr	Clearwater Rvr M F
	SP	Chinook	1999	1,050,000	4/19/99	4/23/99	Dworshak H	Clearwater Rvr M F
	SU	Steelhead	1999	600,000	4/19/99	4/23/99	S Fk Clearwater R	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	226,364	4/23/99	4/26/99	Sawtooth H	Salmon River
Winthrop	SU	Steelhead	1999	113,000	4/14/99	5/15/99	Winthrop H	Methow River
	Agency Total:				3,899,364			

Hatchery Release Summary
For the Last Two Weeks
From 4/23/99 to 5/06/99

Hatchery	Species...	Migration	Year	Number ...Release Dates...			Release Site	River Name
				Released	Begin	End		
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
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	40,000	4/15/99	4/30/99	Northwestern Lake	White Salmon River
	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
Turtle Rock	SU	Chinook	1999	203,000	4/20/99	4/30/99	Turtle Rock H	Mid-Columbia River
	SU	Steelhead	1999	145,000	4/20/99	4/30/99	Wenatchee R	Wenatchee River
	SU	Steelhead	1999	40,000	4/20/99	4/30/99	Entiat R	Entiat 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	Steelhead	1999	216,700	4/15/99	5/5/99	Methow R	Methow River
	SU	Steelhead	1999	30,000	4/15/99	5/12/99	Wells H	Mid-Columbia River
	SU	Chinook	1999	410,000	4/15/99	5/15/99	Wells H	Mid-Columbia River
	SU	Steelhead	1999	78,500	4/15/99	5/12/99	Okanogan R	Okanogan River
	SU	Steelhead	1999	118,000	4/20/99	4/30/99	Chewuch R	Methow River
	SU	Steelhead	1999	148,000	4/20/99	5/20/99	Winthrop H	Methow River
	SU	Steelhead	1999	78,500	4/27/99	5/15/99	Similkameen Acclim Pd	Okanogan River
	SU	Steelhead	1999	118,000	5/1/99	5/10/99	Twisp R	Methow River
Agency Total:				5,488,250				
Warm Spgs Tribe								
Oak Springs	WI	Steelhead	1999	52,000	4/14/99	5/4/99	E Fk Hood R	Hood River
Agency Total:				52,000				
Yakima Tribe								
Clark Flat	SP	Chinook	1999	231,220	3/18/99	6/1/99	Clark Flat Acclim Pd	Yakama River
Easton Pond	SP	Chinook	1999	156,718	3/18/99	6/1/99	Easton Pd	Yakama River
Leavenworth		Coho	1999	419,000	5/1/99	5/1/99	Leavenworth H	Wenatchee River
Prosser	FA	Chinook	1999	1,690,000	4/25/99	5/25/99	Prosser Acclim Pd	Yakama River
Agency Total:				2,496,938				
Total Release:				31,740,852				

Hatchery Release Summary
For the Next Two Weeks
From 5/7/99 to 5/20/99

Hatchery	Species..	Migration	Year	Number		...Release Dates...		Release Site	River Name
				Released		Begin.....	End		
ODFW									
Big Canyon	SU	Steelhead	1999	100,000		5/18/99	5/18/99	Big Canyon H	Grande Ronde River
	SU	Steelhead	1999	100,000		5/19/99	6/2/99	Big Canyon H	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:				32,274,352					
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					
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
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:				952,000					
Total Release:				41,071,852					

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)
04/23/99	331	146	17	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	336	9	10	1,244	76,238	124,204	29,549	1,823	27,442	40,816	15,235
04/29/99	144	53	10	710	79,402	124,530	37,756	1,152	25,955	38,417	12,984
04/30/99	256	46	9	509	85,365	103,253	41,624	1,342	32,450	25,350	16,725
05/01/99	---	---	---	---	69,701	99,033	32,058	1,126	33,313	24,371	12,915
05/02/99	---	---	---	---	106,653	57,122	46,584	1,522	34,533	16,832	9,511
05/03/99	115	35	6	343	114,322	69,094	41,620	1,415	46,921	27,551	15,921
05/04/99	205	38	10	287	103,110	87,735	34,982	2,092	63,965	28,867	12,517
05/05/99	131	36	11	347	69,052	85,374	19,992	1,348	77,434	32,737	10,874
05/06/99	212	26	11	279	64,209	105,705	27,469	1,570	93,283	30,910	14,819
Total:	3,031	446	101	5,849	1,096,074	1,155,634	418,079	17,103	594,135	479,701	189,737
# Days:	10	12	10	10	14	14	14	14	14	14	14
Average:	303	37	10	585	78,291	82,545	29,863	1,222	42,438	34,264	13,553

Wild Yearling Chinook

Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)
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	36	5	23	319	20,612	47,775	6,375
04/29/99	21	48	17	202	21,835	37,773	13,802
04/30/99	79	71	20	208	20,728	33,399	14,533
05/01/99	---	---	---	---	10,671	24,027	11,976
05/02/99	---	---	---	---	20,501	16,070	10,640
05/03/99	8	31	10	98	19,656	22,184	9,864
05/04/99	30	43	29	52	17,789	22,566	6,811
05/05/99	31	32	25	92	10,181	17,711	5,802
05/06/99	50	29	21	63	9,666	20,142	5,069
Total:	557	430	281	1,795	264,737	365,516	118,817
# Days:	10	12	10	10	14	14	14
Average:	56	36	28	180	18,910	26,108	8,487

Wild Subyearling Chinook

LGR (INDEX)	LGS (INDEX)	LMN (INDEX)
0	0	0
217	0	0
0	0	0
571	0	0
0	0	0
0	0	0
0	0	0
223	0	0
454	0	0
230	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
1,695	0	0
14	14	14
121	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)
04/23/99	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	0	0	0	3	1,106	190	1,012
04/29/99	0	0	0	0	0	0	0	3	1,798	342	947
04/30/99	0	0	0	0	0	0	0	2	1,251	163	942
05/01/99	---	---	---	---	0	0	0	2	1,071	161	219
05/02/99	---	---	---	---	0	0	0	0	1,092	497	144
05/03/99	0	0	0	0	0	0	0	0	2,243	78	532
05/04/99	0	0	0	0	0	0	0	10	1,664	89	304
05/05/99	0	0	0	0	0	0	0	5	969	65	148
05/06/99	0	0	0	0	0	0	0	4	2,418	98	379
Total:	0	0	0	0	0	0	0	89	27,887	2,754	34,345
# Days:	10	12	10	10	14	14	14	14	14	14	14
Average:	0	0	0	0	0	0	0	6	1,992	197	2,453

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)
04/23/99	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	0	1	0	878	0	26	166	5,115	3,037
04/29/99	0	0	0	3	744	390	0	35	120	6,670	3,251
04/30/99	0	0	0	3	0	751	179	65	227	3,767	5,839
05/01/99	---	---	---	---	454	191	184	72	113	6,357	4,925
05/02/99	---	---	---	---	461	921	179	119	115	3,875	2,378
05/03/99	0	0	0	5	226	1,464	84	33	93	4,076	5,662
05/04/99	0	0	0	4	444	1,082	47	112	741	6,093	4,984
05/05/99	0	0	0	5	443	746	29	85	836	10,774	5,159
05/06/99	0	0	0	5	230	1,145	52	103	558	7,703	11,181
Total:	0	0	0	34	3,002	9,324	810	742	3,460	68,539	58,284
# Days:	10	12	10	10	14	14	14	14	14	14	14
Average:	0	0	0	3	214	666	58	53	247	4,896	4,163

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)
04/23/99	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	52	41	128	234	94,863	71,397	20,417	128	6,029	7,959	1,302
04/29/99	41	55	95	250	121,087	77,611	24,410	117	3,955	9,236	1,636
04/30/99	238	48	63	156	131,725	72,331	20,992	143	4,844	5,617	3,277
05/01/99	---	---	---	---	135,088	84,772	23,214	178	4,960	6,685	2,007
05/02/99	---	---	---	---	206,395	57,286	27,539	324	5,333	6,980	1,765
05/03/99	33	33	62	176	159,283	172,007	32,256	162	6,168	7,331	3,268
05/04/99	53	49	73	138	143,304	204,998	36,821	417	9,857	10,881	2,359
05/05/99	83	55	51	146	430,469	194,574	87,587	235	17,449	7,709	1,113
05/06/99	187	26	63	120	97,580	88,531	38,954	288	14,144	7,323	4,434
Total:	765	470	1,162	1,573	1,974,410	1,212,506	374,008	2,293	107,356	92,968	26,381
# Days:	10	12	10	10	14	14	14	14	14	14	14
Average:	77	39	116	157	141,029	86,608	26,715	164	7,668	6,641	1,884

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)
04/23/99	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	17	28	41	42	7,202	13,506	4,480	244	2,876	7,883	1,832
04/29/99	6	50	28	36	11,166	11,916	4,791	250	1,977	7,668	1,486
04/30/99	24	39	15	29	9,584	8,837	3,050	292	2,177	5,796	3,014
05/01/99	---	---	---	---	10,217	9,360	2,579	286	1,690	8,757	1,751
05/02/99	---	---	---	---	16,125	6,817	3,755	358	2,523	7,801	1,945
05/03/99	3	42	19	23	9,489	13,910	3,101	190	2,245	6,851	2,622
05/04/99	1	62	38	15	6,450	14,064	3,469	332	2,141	6,410	1,712
05/05/99	3	27	18	21	10,845	8,937	4,842	246	4,708	6,338	1,113
05/06/99	13	54	15	6	4,373	4,014	1,726	339	4,095	4,595	3,487
Total:	81	414	276	241	168,572	148,547	44,581	3,246	34,049	91,269	28,360
# Days:	10	12	10	10	14	14	14	14	14	14	14
Average:	8	35	28	24	12,041	10,611	3,184	232	2,432	6,519	2,026

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 Indices

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)
04/23/99	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	0	0	0	67	111	14	48
04/29/99	0	0	0	0	0	0	0	72	0	18	0
04/30/99	0	0	0	0	0	0	0	23	57	6	0
05/01/99	---	---	---	---	0	0	0	31	113	33	109
05/02/99	---	---	---	---	0	0	0	56	344	3	0
05/03/99	0	0	0	0	0	0	0	28	187	252	0
05/04/99	0	0	0	0	0	0	0	28	277	52	38
05/05/99	1	0	0	0	0	0	0	35	692	39	37
05/06/99	0	0	0	1	0	0	0	48	930	55	0
Total:	1	0	0	1	0	0	0	619	3,383	499	316
# Days:	10	12	10	10	14	14	14	14	14	14	14
Average:	0	0	0	0	0	0	0	44	242	36	23

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)
04/23/99	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	0	0	0	497	200	0	2,318	2,932	518	145
04/29/99	0	0	0	0	248	213	228	792	3,356	932	65
04/30/99	0	0	0	0	446	589	0	532	4,607	600	38
05/01/99	---	---	---	---	227	218	184	412	5,409	1,064	255
05/02/99	---	---	---	---	461	390	89	403	8,660	1,324	288
05/03/99	0	0	0	0	0	560	192	979	20,373	1,276	152
05/04/99	0	0	0	0	222	375	79	1,884	26,712	2,833	685
05/05/99	0	0	0	0	221	196	58	1,466	31,437	3,246	631
05/06/99	0	0	0	0	0	582	101	1,700	36,091	7,492	872
Total:	0	0	0	0	3,741	4,522	1,354	10,979	144,907	20,776	3,381
# Days:	10	12	10	10	14	14	14	14	14	14	14
Average:	0	0	0	0	267	323	97	784	10,351	1,484	242

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 May 6, 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	25,796	1,876	30,218	228	52,125	1,010	0	0	0	0	0	0	0	0	0	0	0	0
TDA	8,721	630	19,250	145	27,213	435	0	0	0	0	0	0	0	0	0	0	0	0
JDA	5,055	260	14,870	69	18,482	316	0	0	0	0	0	0	0	0	0	0	0	0
MCN	2,633	135	10,887	61	14,855	243	0	0	0	0	0	0	0	0	0	0	0	0
IHR	673	60	6,441	16	6,325	60	0	0	0	0	0	0	0	0	0	0	0	0
LMN	236	21	3,985	5	4,104	39	0	0	0	0	0	0	0	0	0	0	0	0
LGS	73	4	1,325	2	**	**	0	0	0	0	**	**	0	0	0	0	**	**
LWG	110	11	3,285	5	2,806	21	0	0	0	0	0	0	0	0	0	0	0	0
PRD	534	1	1,251	0	2,649	6	0	0	0	0	0	0	0	0	0	0	0	0
RIS	8	0	85	0	184	0	0	0	0	0	0	0	0	0	0	0	0	0
RRH	3	0	24	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0
WEL	0	0	0	4	19	1	0	0	0	0	0	0	0	0	0	0	0	0

DAM	Coho						Sockeye			Steelhead				
	1999		1998		10-Yr Avg.		10-Yr			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	1,299	1,553	2,815	220	315
TDA	0	0	0	0	0	0	0	0	0	269	666	1,442	184	184
JDA	0	0	0	0	0	0	0	0	0	2,790	4,606	2,679	770	1,310
MCN	0	0	0	1	0	0	0	0	0	309	1,292	2,236	73	432
IHR	0	0	0	0	0	0	0	0	0	764	1,761	2,658	274	509
LMN	0	0	0	0	0	0	0	0	0	575	1,516	2,312	121	446
LGS	0	0	0	0	**	**	0	0	**	841	1,924	**	269	586
LWG	0	0	0	0	0	0	0	0	0	3,002	4,288	5,541	519	786
PRD	0	0	0	0	0	0	3	0	0	6	9	28	0	0
RIS	2	0	0	0	0	0	0	0	0	13	18	43	4	0
RRH	6	0	0	0	0	0	0	0	0	32	71	36	3	0
WEL	0	0	0	0	0	0	0	0	0	0	0	8	0	0

*NOTE: The data is not being received and/or not being updated in a timely fashion.

*RIS is through 4/28, RRH and LGS are through 4/30, LMN is through 5/4 and PRD is through 5/5.

*WEL - WDFW is trapping Spring Chinook on both fish ladders, so data not available at present.

*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.

**Two-Week Transportation Summary
from 04/23/99 to 05/06/99**

	Yearling Chinook	Subyearling Chinook	Steelhead	Coho	Sockeye	Total
LOWER GRANITE DAM						
Collected	884,150	1,050	1,410,800	1,950	2,400	2,300,350
Bypassed	55,192	0	28,374	2	0	83,568
Trucked	0	0	0	0	0	0
Barged	893,636	1,050	1,483,427	2,241	2,486	2,382,840
Total Transported	893,636	1,050	1,483,427	2,241	2,486	2,382,840
LITTLE GOOSE DAM						
Collected	1,245,476	0	1,113,375	7,655	3,694	2,370,200
Bypassed	0	0	0	0	0	0
Trucked	0	0	0	0	0	0
Barged	1,240,233	0	1,113,044	7,649	3,401	2,364,327
Total Transported	1,240,233	0	1,113,044	7,649	3,401	2,364,327
LOWER MONUMENTAL DAM						
Collected	458,876	0	357,445	678	1,161	818,160
Bypassed	8,974	0	209	0	0	9,183
Trucked	0	0	0	0	0	0
Barged	449,137	0	357,170	678	1,155	808,140
Total Transported	449,137	0	357,170	678	1,155	808,140
M McNARY DAM						
Collected	320,471	15,066	76,481	1,866	79,694	493,578
Bypassed	320,201	15,056	76,464	1,859	79,645	493,225
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	2,908,973	16,116	2,958,101	12,149	86,949	5,982,288
Bypassed	384,367	15,056	105,047	1,861	79,645	585,976
Trucked	0	0	0	0	0	0
Barged	2,583,006	1,050	2,953,641	10,568	7,042	5,555,307
Total Transported	2,583,006	1,050	2,953,641	10,568	7,042	5,555,307

**Transportation Summary Report
Cumulative Transportation Summary
through 05/06/99**

	Yearling Chinook	Subyearling Chinook	Steelhead	Coho	Sockeye	Total
LOWER GRANITE DAM						
Collected	1,142,496	1,316	1,621,692	2,307	4,408	2,772,219
Bypassed	63,993	0	34,187	3	0	98,183
Trucked	29,736	126	23,030	183	1,219	54,294
Barged	1,111,882	1,190	1,665,307	2,411	3,157	2,783,947
Total Transported	1,141,618	1,316	1,688,337	2,594	4,376	2,838,241
LITTLE GOOSE DAM						
Collected	1,453,514	0	1,206,411	7,666	5,051	2,672,642
Bypassed	0	0	0	0	0	0
Trucked	1,001	0	1,128	5	120	2,254
Barged	1,445,843	0	1,204,851	7,654	4,535	2,662,883
Total Transported	1,446,844	0	1,205,979	7,659	4,655	2,665,137
LOWER MONUMENTAL DAM						
Collected	620,344	7	404,008	723	2,360	1,027,442
Bypassed	9,484	0	427	0	0	9,911
Trucked	3,464	6	899	0	28	4,397
Barged	605,011	0	402,370	723	2,261	1,010,365
Total Transported	608,475	6	403,269	723	2,289	1,014,762
M McNARY DAM						
Collected	715,636	44,474	143,379	2,056	82,445	987,990
Bypassed	714,467	44,431	143,350	2,049	82,396	986,693
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	3,931,990	45,797	3,375,490	12,752	94,264	7,460,293
Bypassed	787,944	44,431	177,964	2,052	82,396	1,094,787
Trucked	34,201	132	25,057	188	1,367	60,945
Barged	3,162,736	1,190	3,272,528	10,788	9,953	6,457,195
Total Transported	3,196,937	1,322	3,297,585	10,976	11,320	6,518,140