



Fish Passage Center

Weekly Report #99 - 11

May 21, 1999

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SUMMARY OF EVENTS:

Water Supply: Light showers will continue to dominate over the region with moderate temperatures rising to normal levels. Moderate snow melt occurred in the middle Snake River reaches. It is expected increased snow melt will commence all over Snake River drainage next week.

Precipitation increased moderately during the past week, resulting in increased total precipitation for the period of May 1-18: above Coulee was 91% of normal, Snake River above Ice Harbor was 104% of normal and Columbia above The Dalles was 105% of normal. The subbasins with the highest precipitation were Hood/Lower Deschutes with 211% and Willamette Valley with 240%. The lowest precipitation was at Clark Fork with 55% and Flat-head with 70%.

The new May MidMonth Runoff Volume Forecast was issued. There was no significant change in forecasted runoff volumes for the major sites in the basin compared to the May Final Forecast. Cold weather conditions and a showery pattern persisted in the region for the longer forecast time. Changes are in the range of -2% to +1% compared to May Final. The January-July forecast for the Columbia River above The Dalles is 125 MAF, or 118% of average and is 1% higher compared with May Final. Runoff volume forecast for Brownlee reservoir decreased for 2% compared to May Final. The summary of the May Final and Midmonth Runoff Volume Forecasts is given in the following table:

Location	Period	May 99 Final		May 99 Midmonth	
		MAF	%	MAF	%
<i>Libby</i>	Apr-Sep	7.16	106	7.31	108
<i>Hungry Horse</i>	Apr-Sep	2.31	106	2.3	105
<i>Grand Coulee</i>	Jan-Jul	72.4	114	72.9	115
<i>The Dalles</i>	Jan-Jul	124	117	125	118
<i>LowerGranite</i>	Jan-Jul	35.8	120	35.7	120
<i>Dworshak</i>	Apr-Jul	3.2	119	3.19	118
<i>Brownlee</i>	Apr-Jul	7.32	126	7.17	124

System Storage: Persisting cold weather and low precipitation is diminishing reservoir refill for this period of the year. Most of the reservoirs will not be refilled by the Biological Opinion required dates, which will result in lower flows during summer. Given the conditions of current weather pattern, deep drafts of the reservoirs during March for flood control, resulted in low spring flows. Redistribution of the flood control volumes from March into April could improve spring flows and refill of the reservoirs for fish needs.

Hungry Horse is operated to Integrated Rule Curves, defined by the State of Montana. Projected elevation on May 31 is 3510 ft. The reservoir is projected to be full by July 31, instead of June 30 as required by Biological Opinion. This could impact flows for summer migrants. Low precipitation in the basin and delayed snow melt is resulting in lower rate of refill of the reservoir. Current elevation is 3496.11 ft as of May 20. During the previous week the reservoir refilled only 2.5 ft. The outflows were 2.5-3.16 kcfs during working days and 200 cfs during week-ends.

Libby continues with refill on minimum outflow of 4 kcfs. The reservoir is projected to be at 2449.3 ft by July 31 instead of 2460 ft as required by Biological Opinion. Summer flows will be significantly impacted with 450 KAF less augmentation volume available than required by the Biological Opinion.

Arrow reservoir increased outflow to 29.9-30 kcfs by the end of May.

Grand Coulee reservoir was drafted to 1213 ft to support flows at Priest Rapids. Inflows were in the range of 130.1 kcfs-140.1 kcfs during the previous week. Outflows were in the range of 135.7 kcfs-153.8 kcfs during the same period.

Dworshak reservoir was operated with 14 kcfs (powerhouse capacity is 10 kcfs) through

May 16 to augment low flows at Lower Granite. The outflows were decreased gradually to 1.4 kcfs on May 20. It is uncertain that reservoir will refill by July 31, the beginning of the summer augmentation season. Deep draft of the reservoir for flood control during March resulted in failure of the reservoir refill by July 31.

Brownlee reservoir was operated with outflows of about 30 kcfs during the previous week and will continue with similar outflows during the coming week. Inflows are in the range of 32 kcfs-36 kcfs, but Idaho Power Company refused to pass inflows as requested by Fishery Agencies for improvement of low flows at Lower Granite to avoid spill at Brownlee and Hells Canyon Dams Current elevations on May 20 and the end of April elevations summarized in the following Table:

Reservoir	Actual elev. As of May 20	Max Reservoir pool [ft]	End of April Elevation [ft]
Libby	2355.95	2459	2338.6
Hungry Horse	3496.11	3560	3489.6
Grand Coulee	1213.5	1290	1220.4
Brownlee	2007.58*	2077	1990.5
Dworshak	1455.14	1600	1453.4

* as of May19

Upper Snake reservoirs:

As of May 20, American Falls was at 97% of capacity, being slightly drafted for flood control during the previous week, Palisades is at 29% of full and Jackson Lake is 61% of full. Commence of the snowmelt and precipitation in the region has resulted in continuation of the higher flows at Milner of 13 kcfs (as of May 20). The system is at 69% of capacity.

Boise and Payette River Basins:

Both systems continue to be operated for flood control but are also refilling. The Boise River system (Anderson Ranch, Arrowrock and Lucky Peak) was at 59% of capacity as of May 20. The outflow from Boise River system is 1.5 kcfs (as of May 20).

The Payette River system (Cascade, Deadwood) was at 59% of capacity as of May 20. The outflow from Payette river system is 4.6 kcfs (as of May 20).

Streamflow: Biological Opinion spring flow targets based on the April Final Runoff Volume Forecast are 100 kcfs at Lower Granite and 260 kcfs at McNary.

Average weekly flows at Lower Granite continue to be below the required BiOp spring flow targets during this week (weekly flows were below the flow target during the first three weeks of April). The weekly average flow of 84.8 kcfs was lower than the previous week average flow of 91.6 kcfs. Average weekly flow at McNary was 260.6 kcfs, with flows in the range of 248.3 kcfs to 270.5 kcfs for the period of May 14-20. The COE failed to forecast flows with greater accuracy in its SSARR modeling runs because they applied normal weather pattern (instead of an apparent colder weather pattern with delayed snowmelt) and deep reservoir drafts for flood control earlier in the season. This resulted in the COE's inability to use the reservoirs to augment low spring flows. Redistribution of the evacuation of the flood control volumes from the March period into April would significantly improve spring flows in the most critical periods.

Daily average flows at Priest Rapids were fluctuating in the range of 161.9 kcfs to 180.7 kcfs, although Fishery Agencies requested stable average daily flows of 170 kcfs. Significant hourly flow fluctuations were noted during last week in Priest Rapids Dam operations. The total range of daily hourly fluctuations is presented in the following table:

Date	Average Daily Flow at Priest Rapids [kcfs]	Hourly fluctuations [kcfs]
May 14	166.4	145.5-183.2
May 15	179.9	160.6-241.6
May 16	166.8	150.7-185.8
May 17	180.7	149.4-194.7
May 18	161.9	151.2-173.3
May 19	175.1	151.3-234.4
May 20	178.5	155.8-188.8

The average discharge for the major run-of-river projects for May 7-20 period are given in the following Table:

Project	Average Discharge [kcfs]	
	May 14-20	May 7-May 13
Priest Rapids	172.8	159.5
McNary	260.6	257.2
Lower Granite	84.8	91.26
Bonneville	273.8	277.4

Spill: Outflow from Dworshak Dam continued at 14 Kcfs, with spill occurring above hydraulic capacity (approximately 3.6 Kcfs spill) until 2000 hours on May 17. Flows were then reduced to hydraulic capacity and no spill occurred since that time. Flows at the Hells Canyon Complex have also been reduced over the past week, limiting spill. The Biological Opinion spill program is presently being implemented at the lower Snake projects. The lower flows have resulted in lower volumes of spill in the Snake River, leading to lower dissolved gas levels.

The FERC spill program continues at the Mid Columbia projects.

Biological Opinion spill levels continue at the lower Columbia projects.

Levels of total dissolved gas were at, or below, the waivers at locations measured with the exception of the Lower Monumental forebay monitor. It is unclear why the monitor is reading higher at this time since the volume of water spilled at Little Goose dam has not changed. In general, the spill volumes in the system have decreased as flows decreased and, consequently, the gas cap levels are not being reached at all projects.

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. From May 11 to the present, daily flows have only averaged between 81 and 89 kcfs at Lower Granite Dam, and the trend in the passage indices of yearling chinook and steelhead there has remained relatively flat. This is in contrast to more typical years when the natural spring freshet in the Snake River drainage would now be pushing a larger proportion of the chinook and steelhead past Lower Granite Dam at this time. Little Goose and Lower Monumental dams have had one or more days of relatively high yearling hatchery chinook passage indices this week, but the hatchery steelhead passage indices remained very low at these sites this week. The Snake River trap at Lewiston saw a jump in hatchery steelhead as late as May 19, so hatchery steelhead are still emigrating from the tributaries above Lewiston.

In the Mid-Columbia River, this week's daily passage indices of yearling chinook at Rock Island

Dam have remained within the same range as last week, while those of coho and steelhead have increased and those of sockeye have decreased. Daily flows at Rock Island Dam this week averaged 167 kcfs, which is 16 kcfs higher than last week's average.

In the lower Columbia River, this week has seen McNary Dam's yearling chinook passage indices continue to increase, reaching over 143,000 fish on May 16. Coho passage indices also increased this week at McNary Dam, while those of steelhead and sockeye were lower. At John Day and Bonneville dams, the trend in passage indices of yearling chinook, coho, and steelhead has remained relatively flat over the past two weeks, with some increase occurring late this week for yearling chinook at both dams. Wild sockeye passage indices hit their season highs early this week at both John Day and Bonneville dams. Spring Creek Hatchery tule subyearling chinook have been passing Bonneville Dam throughout this week with peak passage on May 14 and 15. Daily flows at Bonneville Dam averaged 274 kcfs for the week, similar to last week's average.

Adult Fish Passage: At Bonneville Dam, daily passage counts of adult spring chinook ranged from a high count of 671 on May 14 to a low of 298 on May 20 for the week of May 14 to May 20. The count of adult spring chinook was 35,488 through May 20, and actually surpassed the 1998 count of 35,077, but remained well below the 10-year average count of 63,174. Adult chinook counts declined through the week. Of the chinook past Bonneville, 14,887 have been counted at The Dalles Dam, 10,799 at John Day Dam, and 6,681 at McNary Dam. About 42 percent of the spring chinook past Bonneville Dam have moved upstream past The Dalles. This compares to the 10-year average of 57% and the 1998 percentage of about 65% of the Bonneville count moving upstream.

Through May 20, a total of 2,808 adult spring chinook was counted at the lower Snake River dam (Ice Harbor) with 1,014 adult spring chinook counted at Lower Granite Dam. In the

Mid-Columbia River, 2,622 adult spring chinook have been counted at Priest Rapids Dam. Fish counts received from Rock Island Dam through May 16 were 930 adult chinook. 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. About 547 adult chinook have been counted at Prosser Dam (Yakama R) through May 12 (information from Yakama Tribe). At 3-Mile Dam in the Umatilla River, about 520 adult spring chinook have been tallied through May 11 (information from Umatilla Tribe). At Lower Granite Dam, most adult chinook sampled to date were in good condition with about 2.5% of the fish reported with lesions on the head area. Approximately 30% of the sampled fish showed marine mammal attacks, open wounds (flesh) have been reported on about 6.6% of the sampled fish (information from NMFS).

The number of jack chinook salmon passing Bonneville Dam was 7,205; this compares to only 563 jacks in 1998 and 2,169 for the 10-year average. Daily counts of jack spring chinook decreased through the week from about 400 per day early in the week to less than 300 by week's end. About 2,000 have been tallied at McNary Dam, with 1,130 counted at Ice Harbor Dam and 60 at Priest Rapids Dam. Jack counts exceed the 10-year average at all projects.

At Bonneville Dam, the daily passage of steelhead ranged between 30 to 50 fish per day for the past week, with the cumulative count for the season at 1,818. Of this total, 15% or 274 were "wild" origin steelhead. At Lower Granite Dam, steelhead passage for the season is basically complete with daily counts less than 10 on a daily basis. New steelhead passing Bonneville at this time of year are normally destined for Bonneville tributary streams (Skamania stock).

Hatchery Releases: During the past two weeks, approximately 8.8 million anadromous salmon were released from hatcheries, acclimation ponds,

or were directly planted into streams. For the upcoming two weeks, about 7.4 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 will be released into streams above Bonneville Dam for the 1999 Migration Year. Most yearling spring, summer, and fall chinook and coho have been released from the hatcheries in each River Reach. Steelhead releases are nearly completed for the year. Some subyearling bright fall chinook have been released during the past two weeks, with late May through late June being the peak times for releasing the fish. Subyearling summer chinook will be released in the Mid-Columbia in June. The final release of Tule fall chinook was completed May 13 from Spring Creek NFH.

Lower Columbia River (above Bonneville Dam to McNary Dam) – Release of 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. Coho releases have been completed for the year as well. Subyearling fall chinook will be released over the next month in the Klickitat, Little White Salmon, and Umatilla rivers.

Mid-Columbia River – Steelhead releases are nearly completed for the year in the Mid-Columbia. All yearling chinook have been planted to date. Coho releases are still occurring from acclimation ponds in the Yakama River. All hatchery sockeye have been released for the 1999 migration. Subyearling fall and summer chinook remain to be planted from hatcheries and acclimation ponds.

Snake River – Releases of yearling fall chinook and coho from State, Federal or Tribal hatcheries have been completed for the 1999 migration season. Steelhead releases are nearing completion for the year. Subyearling fall chinook will be released in June from Big Canyon (Clearwater drainage), CPT John (Snake R) and from Lyons Ferry H (direct plant). About 10,000 Sockeye (Red Fish Lake stock) were released in the upper Salmon River this spring season.

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
05/07/99	130.2	0.0	139.4	0.0	150.1	10.0	152.6	25.1	159.6	40.9	151.1	30.6	169.5	127.2
05/08/99	138.8	0.0	132.4	0.0	141.6	9.3	138.8	24.4	140.5	40.8	140.2	28.8	152.4	114.8
05/09/99	126.5	0.0	128.5	0.0	141.5	9.7	147.9	23.9	153.1	40.9	158.1	32.1	175.9	131.7
05/10/99	127.8	0.0	136.4	0.0	148.3	9.9	154.9	20.1	149.7	41.0	144.8	29.2	152.6	114.9
05/11/99	127.7	0.0	127.2	0.0	137.6	9.8	138.0	22.7	142.3	41.0	138.7	28.3	153.1	115.1
05/12/99	134.0	0.0	137.9	0.0	148.3	10.4	150.7	23.1	150.0	41.1	134.5	27.0	146.2	109.5
05/13/99	140.8	0.0	142.6	0.0	158.6	11.8	161.3	21.2	163.5	40.2	154.6	30.9	166.9	126.0
05/14/99	153.3	0.0	159.1	0.0	169.6	12.1	164.1	23.0	163.4	40.4	150.5	29.9	166.4	125.3
05/15/99	148.0	0.0	147.1	0.0	157.9	12.1	165.5	23.6	170.5	40.8	163.8	33.2	179.9	134.9
05/16/99	153.8	0.0	157.1	0.0	169.2	12.1	168.5	25.6	171.3	41.0	157.2	31.6	166.8	125.4
05/17/99	147.6	0.0	151.0	0.0	159.5	13.0	161.4	25.5	164.7	41.1	161.9	32.8	180.7	136.2
05/18/99	149.7	0.0	150.6	0.0	161.1	13.8	161.2	26.7	163.2	41.1	152.1	30.5	161.9	121.9
05/19/99	137.2	0.0	145.5	0.0	161.2	13.8	165.3	24.9	169.0	41.0	157.9	31.7	175.1	131.2
05/20/99	135.7	0.0	---	---	157.4	13.8	164.8	24.8	165.1	40.9	166.3	33.5	178.5	133.8

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
05/07/99	11.7	2.3	31.6	32.5	92.0	34.5	88.3	20.8	88.8	18.3	93.7	64.7		
05/08/99	14.0	3.7	31.0	32.6	95.7	34.5	92.9	19.8	97.9	18.1	101.7	73.2		
05/09/99	14.0	3.7	37.2	35.1	93.4	34.7	89.3	20.0	92.0	17.6	94.4	70.0		
05/10/99	14.0	3.7	41.5	31.8	95.8	33.5	93.0	20.7	95.9	19.0	99.6	70.8		
05/11/99	14.0	3.7	42.3	30.6	88.4	33.6	84.7	21.1	89.8	17.6	93.7	65.9		
05/12/99	14.0	3.7	36.4	30.7	87.0	35.3	82.4	22.3	86.2	18.6	90.1	64.7		
05/13/99	14.0	3.7	32.3	30.5	86.5	35.3	81.5	22.1	83.7	17.9	87.6	57.3		
05/14/99	14.0	3.6	35.7	30.7	86.6	35.4	83.0	22.4	85.9	18.9	91.0	61.8		
05/15/99	14.0	3.6	33.2	30.4	83.1	35.2	80.8	22.9	83.2	18.0	86.4	61.9		
05/16/99	14.0	3.6	33.2	30.3	81.1	36.1	78.2	24.8	80.4	20.5	86.9	59.7		
05/17/99	13.3	3.0	32.2	30.4	82.7	35.3	78.8	22.5	81.6	19.1	85.9	59.5		
05/18/99	10.3	0.0	32.9	30.4	82.3	35.0	78.2	22.7	78.6	19.5	84.3	56.8		
05/19/99	8.5	0.0	34.1	30.4	88.7	35.2	84.1	22.1	88.2	18.6	89.8	61.8		
05/20/99	1.4	0.0	---	---	88.9	35.3	86.4	22.0	88.9	19.1	94.3	70.7		

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		
05/07/99	270.2	104.0	286.6	102.8	279.4	102.0	300.0	96.7	80.2	113.9
05/08/99	263.1	110.8	266.4	102.3	261.1	79.0	276.6	96.4	76.0	95.0
05/09/99	254.4	108.2	262.6	101.1	252.9	76.0	270.2	97.1	76.7	87.2
05/10/99	283.5	128.7	315.4	83.9	312.1	175.0	304.1	96.7	79.5	118.8
05/11/99	245.6	112.2	258.5	54.5	260.0	167.0	284.7	93.7	75.8	106.0
05/12/99	244.2	115.2	235.5	54.9	237.5	150.0	254.6	94.2	73.1	78.1
05/13/99	239.2	106.7	246.9	54.3	232.8	82.0	251.8	94.2	75.7	72.7
05/14/99	262.4	114.3	275.9	100.6	271.1	81.4	275.6	94.7	80.6	91.1
05/15/99	261.1	109.9	256.4	94.5	245.7	71.0	258.6	95.1	77.1	77.2
05/16/99	248.3	104.5	255.2	54.8	254.0	145.0	272.2	92.8	78.5	91.7
05/17/99	264.4	114.9	262.2	54.9	259.4	166.0	271.4	94.0	79.7	88.5
05/18/99	251.6	108.7	266.1	55.8	264.2	167.0	282.1	94.2	78.3	100.4
05/19/99	262.4	110.5	277.0	102.8	267.9	97.0	269.1	94.6	77.8	87.5
05/20/99	270.5	123.4	---	---	273.2	84.0	287.6	96.1	76.7	105.7

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

Total Dissolved Gas Saturation Data at Upper Columbia River Sites

Date	<u>Can. Boundary</u>			#	<u>Grand Coulee</u>			#	<u>Tlwtr G. Coulee</u>			#	<u>Chief Joseph</u>			#	<u>Tlwtr C. Joseph</u>			#
	<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>		<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>		<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>		<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>		<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>	
5/7	116	117	118	24	108	108	108	24	105	106	106	24	105	106	106	24	107	108	108	24
5/8	114	115	116	24	108	108	109	24	106	106	106	24	105	106	106	24	107	108	108	24
5/9	114	115	116	24	108	108	109	24	106	106	107	24	106	106	106	23	107	108	109	23
5/10	115	115	116	24	109	109	110	24	106	107	107	24	106	106	107	23	107	108	109	23
5/11	114	116	116	24	110	110	111	24	107	108	108	24	107	107	108	23	108	109	110	23
5/12	115	115	116	24	111	111	112	24	108	109	109	24	108	108	109	23	110	110	111	23
5/13	113	113	114	24	111	111	112	24	108	109	109	24	108	109	109	23	110	111	111	23
5/14	112	112	112	24	111	112	112	24	109	109	109	24	108	108	109	24	109	110	111	24
5/15	111	111	111	24	111	111	111	24	108	109	109	24	109	109	109	24	110	110	111	24
5/16	110	111	111	24	111	111	111	24	108	109	109	24	109	109	109	23	110	110	111	23
5/17	110	111	111	24	111	111	111	24	109	109	109	24	109	109	109	23	111	111	111	23
5/18	111	111	111	24	111	111	112	24	109	109	110	12	109	109	110	23	110	111	111	23
5/19	110	111	112	24	111	112	113	24	109	109	110	21	109	109	111	23	109	109	109	23
5/20	110	111	112	24	112	113	113	24	109	110	110	22	109	110	110	23	110	111	113	23

Total Dissolved Gas Saturation Data at Mid Columbia River Sites

Date	<u>Wells</u>			#	<u>Rocky Reach</u>			#	<u>Tlwtr Rocky R.</u>			#	<u>Rock Island</u>			#	<u>Tlwtr Rock Isl</u>			#
	<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>		<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>		<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>		<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>		<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>	
5/7	106	106	106	13	107	107	108	23	108	109	110	20	107	108	109	22	117	117	118	21
5/8	106	106	107	23	107	107	107	21	108	108	109	21	107	108	108	22	117	118	119	22
5/9	106	107	107	24	107	107	107	22	108	108	109	20	107	107	108	22	116	117	117	20
5/10	106	106	107	10	107	107	108	23	108	108	109	22	107	107	107	23	116	117	118	22
5/11	---	---	---	0	108	108	109	20	109	109	110	19	107	107	109	18	117	117	118	17
5/12	---	---	---	0	108	108	108	21	110	110	111	19	108	109	109	23	117	117	118	22
5/13	---	---	---	0	108	108	109	22	109	110	110	21	108	108	109	22	116	117	118	21
5/14	---	---	---	0	109	109	109	24	110	110	111	24	108	109	110	24	117	118	118	23
5/15	---	---	---	0	108	108	109	23	110	110	111	23	109	109	110	24	117	117	118	24
5/16	---	---	---	0	109	109	109	24	111	111	111	24	109	109	111	24	118	118	118	24
5/17	---	---	---	0	109	109	110	24	111	111	112	24	109	110	110	24	118	118	119	24
5/18	---	---	---	0	109	110	110	23	111	112	112	23	110	110	111	24	118	119	119	24
5/19	110	110	110	15	109	110	110	22	111	111	111	22	109	109	110	24	118	119	119	24
5/20	110	111	111	17	110	110	110	24	111	112	112	24	110	110	110	24	118	119	119	24

Total Dissolved Gas Saturation at Mid Columbia River Sites, and Dworshak

Date	<u>Wanapum</u>			#	<u>Dwns Wanapum</u>			#	<u>Priest Rapids</u>			#	<u>Dwns P Rapids</u>			#	<u>Dworshak</u>			#
	<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>		<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>		<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>		<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>		<u>24 h Avg</u>	<u>12 h Avg</u>	<u>High</u>	
5/7	111	111	112	24	117	118	120	24	114	115	115	24	120	121	121	24	103	104	105	24
5/8	110	111	111	24	116	117	119	24	113	114	115	24	120	120	120	24	104	105	106	23
5/9	111	111	112	24	116	117	119	24	113	113	114	24	120	120	121	24	108	109	109	24
5/10	111	112	112	24	117	118	119	24	115	116	117	24	118	120	120	24	108	109	109	24
5/11	112	113	114	24	118	119	120	24	116	116	117	24	120	121	122	24	109	109	109	24
5/12	111	112	112	24	118	118	121	24	114	115	117	24	119	120	120	24	109	109	109	24
5/13	109	110	110	24	115	116	116	24	111	112	112	24	120	120	120	24	109	109	109	24
5/14	110	111	113	24	116	117	118	24	113	113	114	24	120	120	121	24	105	106	107	24
5/15	111	112	113	24	116	117	119	24	112	113	114	24	121	121	122	24	105	105	106	24
5/16	111	112	112	24	117	118	119	24	114	115	116	24	121	121	122	24	109	109	109	24
5/17	112	113	114	24	117	119	121	24	115	116	117	24	121	121	122	24	108	109	109	24
5/18	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	103	103	103	24
5/19	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	103	103	104	24
5/20	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	110	112	112	24

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

Total Dissolved Gas Saturation Data at Clearwater and Snake River Sites

Date	Clearwater			#	Anatone			#	Snake-Lewiston			#	Lower Granite			#	Tiwtr L. Granite			#			
	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		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High
5/7	---	---	---	0	105	105	106	24	102	103	104	24	104	105	105	24	112	117	119	24			
5/8	---	---	---	0	104	105	106	24	103	104	104	24	105	105	105	24	112	117	118	24			
5/9	104	105	106	24	104	104	105	24	103	104	105	24	104	104	104	24	112	117	118	24			
5/10	104	105	106	23	105	106	107	24	103	105	106	24	104	105	106	24	112	117	119	24			
5/11	105	106	107	24	105	106	107	24	104	106	107	24	105	105	106	24	111	116	118	24			
5/12	105	106	107	23	105	105	106	24	104	105	107	24	106	106	107	24	112	117	118	24			
5/13	104	105	105	24	104	105	105	24	103	104	104	24	105	106	106	24	112	117	118	24			
5/14	---	---	---	0	104	105	105	24	104	105	106	24	105	106	106	24	112	117	118	24			
5/15	---	---	---	0	104	105	105	24	103	104	106	24	104	104	105	24	111	117	118	24			
5/16	105	106	107	24	104	106	106	24	104	106	107	24	105	106	107	24	112	116	118	24			
5/17	105	105	106	24	104	104	105	24	103	104	105	24	106	106	107	24	111	116	117	24			
5/18	102	103	103	24	104	105	106	24	102	103	105	24	106	106	107	24	111	116	117	24			
5/19	102	103	104	23	104	105	106	24	102	104	105	24	106	107	108	24	111	115	116	24			
5/20	102	103	104	24	104	105	106	23	102	103	104	24	106	106	106	24	111	115	116	24			

Total Dissolved Gas Saturation Data at Lower Snake River Sites

Date	Little Goose			#	Tiwtr L. Goose			#	L. Monumental			#	Tiwtr L. Monum			#	Ice Harbor			#			
	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		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High
5/7	109	109	110	8	114	117	118	24	111	113	114	22	115	117	119	24	112	112	113	24			
5/8	109	111	111	24	113	117	117	24	110	112	112	22	115	118	120	24	112	112	112	24			
5/9	109	111	112	24	114	117	117	24	112	112	114	6	116	119	119	24	112	113	114	24			
5/10	112	114	115	24	115	118	118	24	112	112	116	7	116	119	120	24	114	115	117	24			
5/11	114	115	116	24	116	118	119	24	115	116	117	17	117	118	120	24	115	116	117	24			
5/12	114	115	116	24	117	119	120	24	115	116	117	24	117	119	120	24	115	115	116	24			
5/13	111	112	113	24	115	119	119	24	114	115	116	24	116	118	120	24	114	114	115	24			
5/14	110	111	111	24	114	118	119	24	114	114	115	24	117	119	119	24	113	114	115	24			
5/15	111	112	112	24	115	118	119	24	113	115	116	24	116	118	120	24	113	114	114	24			
5/16	112	114	115	24	116	119	120	24	113	115	116	24	116	118	119	24	114	115	115	24			
5/17	114	116	118	23	116	119	119	24	115	117	119	24	117	118	119	24	115	115	116	24			
5/18	114	116	117	24	117	119	120	24	116	117	118	24	117	118	120	24	115	115	116	24			
5/19	113	114	115	24	116	118	119	24	115	117	119	24	117	119	120	24	115	116	117	24			
5/20	115	116	117	24	116	118	119	24	116	117	119	24	118	119	120	24	116	116	117	24			

Total Dissolved Gas Saturation Data at Lower Columbia River Sites

Date	Twttr Ice Har.			#	Pasco			#	McNary-Oregon			#	McNary-Wash.			#	Tiwtr McNary			#			
	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		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High
5/7	115	117	120	24	---	---	---	0	111	111	112	24	111	112	113	24	117	119	120	24			
5/8	117	119	120	24	---	---	---	0	111	111	111	24	111	111	111	24	118	119	119	24			
5/9	116	119	120	24	---	---	---	0	110	111	112	23	110	110	111	24	117	119	119	24			
5/10	117	119	121	23	---	---	---	0	112	114	116	24	112	114	115	24	119	120	120	24			
5/11	116	118	121	24	---	---	---	0	113	114	116	22	114	114	115	24	118	119	119	24			
5/12	116	118	121	24	---	---	---	0	113	113	114	24	114	114	115	20	118	119	119	24			
5/13	115	117	121	24	---	---	---	0	112	112	113	24	111	112	113	24	117	118	119	24			
5/14	116	117	118	24	---	---	---	0	110	111	111	24	110	110	111	24	118	119	119	24			
5/15	115	117	118	24	---	---	---	0	110	111	113	24	110	110	111	24	117	119	120	24			
5/16	115	117	118	24	---	---	---	0	111	113	115	24	112	113	113	24	117	118	119	24			
5/17	115	116	119	24	---	---	---	0	113	114	115	24	113	114	115	24	119	119	120	24			
5/18	115	116	120	24	---	---	---	0	113	114	115	24	114	115	115	23	119	120	121	23			
5/19	115	116	118	24	---	---	---	0	114	115	116	24	114	115	116	24	119	120	121	24			
5/20	117	119	120	24	---	---	---	0	113	113	114	12	113	114	115	13	120	120	121	13			

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

Total Dissolved Gas Saturation Data at Lower Columbia River Sites

Date	<u>John Day</u>			<u>Tlwr John Day</u>			<u>The Dalles</u>			<u>Dnstr T. Dalles</u>			<u>Bonneville</u>							
	<u>24 h</u>	<u>12 h</u>	<u>High</u>	#	<u>24 h</u>	<u>12 h</u>	<u>High</u>	#	<u>24h</u>	<u>12h</u>	<u>High</u>	#	<u>24h</u>	<u>12h</u>	<u>High</u>	#				
	<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>			<u>AVG</u>							
5/7	107	107	107	23	121	122	123	23	109	111	112	24	115	116	118	24	114	114	115	23
5/8	108	108	109	23	121	122	122	23	111	112	113	23	115	115	116	23	113	114	115	23
5/9	109	109	109	22	121	121	122	22	110	111	112	23	114	115	115	24	111	111	111	21
5/10	109	110	111	23	119	122	124	23	111	113	114	23	118	120	120	24	112	113	114	23
5/11	109	109	109	23	114	119	120	24	111	112	113	23	119	119	120	24	116	117	118	23
5/12	109	109	109	23	114	118	120	24	109	110	112	23	117	118	119	24	115	116	117	23
5/13	109	109	110	19	120	120	121	24	109	110	111	23	114	116	117	24	112	112	113	21
5/14	109	109	109	22	121	121	122	24	111	112	113	24	114	115	116	24	111	112	113	24
5/15	108	108	116	20	119	120	121	23	110	111	111	24	114	115	116	24	110	111	111	24
5/16	107	108	108	23	113	119	120	24	111	112	114	23	117	119	120	24	111	111	112	23
5/17	108	109	109	23	114	119	120	24	110	112	114	23	118	119	120	24	114	115	117	22
5/18	110	110	111	22	115	119	121	24	110	112	112	23	118	119	119	24	116	117	117	22
5/19	110	110	112	23	121	122	122	23	110	112	114	23	116	118	118	24	114	115	115	23
5/20	112	112	112	18	122	122	122	22	111	112	112	23	116	117	118	24	113	115	116	23

Total Dissolved Gas Saturation Data at Lower Columbia River Sites

Date	<u>Warrendale</u>			<u>Skamania</u>			<u>CamasWash.</u>					
	<u>24 h</u>	<u>12 h</u>	<u>High</u>	#	<u>24 h</u>	<u>12 h</u>	<u>High</u>	#	<u>24h</u>	<u>12h</u>	<u>High</u>	#
	<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>			<u>Avg</u>	<u>Avg</u>		
5/7	117	118	119	24	114	115	117	24	114	115	116	24
5/8	116	117	118	24	114	115	116	24	115	117	119	24
5/9	114	115	116	23	113	113	115	23	114	116	117	24
5/10	115	116	117	22	114	115	116	23	114	115	117	24
5/11	118	118	119	23	116	117	118	23	114	115	116	24
5/12	117	118	120	23	115	116	118	23	116	117	118	24
5/13	115	116	117	23	114	115	117	23	114	116	117	24
5/14	115	115	117	24	114	116	117	24	114	116	118	24
5/15	114	115	116	23	112	114	116	24	113	115	116	24
5/16	114	115	116	23	114	115	117	22	114	116	118	24
5/17	116	117	118	23	115	116	118	23	115	115	117	13
5/18	118	118	119	23	116	118	120	23	116	117	118	20
5/19	117	117	118	23	115	116	117	19	116	118	120	24
5/20	116	117	118	23	115	117	118	23	115	116	118	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													
	05/17/99	Yearling Chinook		100	3	0	0.00%	0	0.00%		0	0	0
	05/17/99	Steelhead		98	1	0	0.00%	0	0.00%		0	0	0
Little Goose Dam													
	05/12/99	Yearling Chinook		100	1	0	0.00%	0	0.00%		0	0	0
	05/12/99	Steelhead		100	0	0	0.00%	0	0.00%		0	0	0
	05/19/99	Yearling Chinook		100	4	0	0.00%	0	0.00%		0	0	0
	05/19/99	Steelhead		100	0	0	0.00%	0	0.00%		0	0	0
Lower Monumental Dam													
	05/17/99	Yearling Chinook		100	1	0	0.00%	0	0.00%		0	0	0
	05/17/99	Steelhead		100	5	0	0.00%	0	0.00%		0	0	0
Ice Harbor Dam													
	05/11/99	Yearling Chinook		100	3	0	0.00%	0	0.00%		0	0	0
	05/11/99	Steelhead		72	0	0	0.00%	0	0.00%		0	0	0
	05/14/99	Yearling Chinook		100	6	0	0.00%	0	0.00%		0	0	0
	05/14/99	Steelhead		70	5	0	0.00%	0	0.00%		0	0	0
	05/18/99	Yearling Chinook		100	7	0	0.00%	0	0.00%		0	0	0
	05/18/99	Steelhead		59	0	0	0.00%	0	0.00%		0	0	0
McNary Dam													
	05/13/99	Yearling Chinook		100	3	0	0.00%	0	0.00%		0	0	0
	05/13/99	Steelhead		54	0	0	0.00%	0	0.00%		0	0	0
	05/17/99	Yearling Chinook		100	4	0	0.00%	0	0.00%		0	0	0
	05/17/99	Steelhead		76	0	0	0.00%	0	0.00%		0	0	0
	05/20/99	Yearling Chinook		100	0	0	0.00%	0	0.00%		0	0	0
	05/20/99	Steelhead		100	3	0	0.00%	0	0.00%		0	0	0
Bonneville Dam													
	05/13/99	Yearling Chinook		100	0	0	0.00%	0	0.00%		0	0	0
	05/13/99	Steelhead		100	0	0	0.00%	0	0.00%		0	0	0
	05/17/99	Yearling Chinook		100	0	0	0.00%	0	0.00%		0	0	0
	05/17/99	Steelhead		95	0	0	0.00%	0	0.00%		0	0	0
Rock Island Dam													
	05/13/99	Yearling Chinook		100	3	3	3.00%	0	0.00%		3	0	0
	05/13/99	Steelhead		100	1	0	0.00%	0	0.00%		0	0	0
	05/17/99	Yearling Chinook		100	3	2	2.00%	0	0.00%		2	0	0
	05/17/99	Steelhead		100	1	0	0.00%	0	0.00%		0	0	0
	05/20/99	Yearling Chinook		100	1	0	0.00%	0	0.00%		0	0	0
	05/20/99	Steelhead		100	3	0	0.00%	0	0.00%		0	0	0

Hatchery Release Summary For the Last Two Weeks From 5/7/99 to 5/21/99

Hatchery	Species...	Migration	Year	Number	...Release Dates...		Release Site	River Name
				Released	Begin	..End		
IDFG								
Magic Valley	SU	Steelhead	1999	100,095	4/27/99	5/15/99	Squaw Cr Acclim Pd	Salmon River
Sawtooth		Sockeye	1999	5,000	5/1/99	5/15/99	Sawtooth H	Salmon River
		Agency Total:		105,095				
Nez Perce Tribe								
Kooskia		Coho	1999	220,000	5/10/99	5/11/99	Clear Cr	Clearwater Rvr M F
		Agency Total:		220,000				
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
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:		534,400				
USFWS								
Hagerman	SU	Steelhead	1999	419,036	4/14/99	5/10/99	Little Salmon R	Salmon River
Spring Creek	FA	Chinook	1999	2,999,659	5/13/99	5/13/99	Spring Creek H	Columbia River
Winthrop	SU	Steelhead	1999	113,000	4/14/99	5/15/99	Winthrop H	Methow River
		Agency Total:		3,531,695				
WDFW								
Chiwawa	SU	Steelhead	1999	172,000	4/22/99	5/14/99	Chiwawa H	Wenatchee River
Klickitat		Coho	1999	1,050,000	4/15/99	5/7/99	Klickitat H	Klickitat River
	SP	Chinook	1999	40,600	5/11/99	5/11/99	Klickitat R	Klickitat River
Turtle Rock	SU	Steelhead	1999	145,000	4/20/99	5/15/99	Wenatchee R	Wenatchee River
Wells	SU	Steelhead	1999	30,000	4/15/99	5/20/99	Wells H	Mid-Columbia River
	SU	Steelhead	1999	78,891	4/15/99	5/11/99	Okanogan R	Okanogan River
	SU	Chinook	1999	410,000	4/15/99	5/15/99	Wells H	Mid-Columbia River
	SU	Steelhead	1999	216,700	4/15/99	5/20/99	Methow R	Methow River
	SU	Steelhead	1999	105,000	4/20/99	5/15/99	Chewuch R	Methow River
	SU	Steelhead	1999	148,000	4/20/99	5/20/99	Winthrop H	Methow River
	SU	Steelhead	1999	78,750	4/27/99	5/11/99	Similkameen Acclim Pd	Okanogan River
	SU	Steelhead	1999	105,000	5/1/99	5/15/99	Twisp R	Methow River
		Agency Total:		2,579,941				

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

Hatchery	Species...	Migration	Year	Number	...Release Dates...		Release Site	River Name
				Released	Begin	End		
Yakima Tribe								
Clark Flat	SP	Chinook	1999	231,220	3/18/99	6/1/99	Clark Flat Acclim Pd	Yakama River
Cle Elum Slough		Coho	1999	210,000	5/10/99	5/25/99	Cle Elem Slough	Yakama River
Easton Pond	SP	Chinook	1999	156,718	3/18/99	6/1/99	Easton Pd	Yakama River
		Coho	1999	48,000	5/10/99	5/10/99	Easton Pd	Yakama River
Jack Creek Pond		Coho	1999	240,000	5/10/99	5/25/99	Jack Creek Acclim Pd	Yakama River
Leavenworth		Coho	1999	67,500	4/28/99	5/10/99	Nason Cr	Wenatchee River
		Coho	1999	419,000	4/28/99	5/30/99	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:	1,874,438				
			Total Release:	8,845,569				

Hatchery Release Summary For the Next Two Weeks From 5/21/99 to 6/3/99

Hatchery	Species	Migration	Year	Number		...Release Dates...		Release Site	River Name
				Released	Begin....End	Released	Begin....End		
Umatilla Tribe									
Imeques	FA	Chinook	1999	1,682,000	5/25/99	5/31/99	Imeques Acclim Pd	Umatilla River	
	Agency Total:			1,682,000					
WDFW									
Klickitat	FA	Chinook	1999	4,000,000	6/1/99	6/20/99	Klickitat H	Klickitat River	
	Agency Total:			4,000,000					
Yakima Tribe									
Prosser	FA	Chinook	1999	1,690,000	5/25/99	5/25/99	Prosser Acclim Pd	Yakama River	
	FA	Chinook	1999	79,000	5/25/99	5/25/99	Prosser Acclim Pd	Yakama River	
	Agency Total:			1,769,000					
Total Release:				7,451,000					

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)
05/07/99	0	0	0	0	0	0	0	2	4,375	330	290
05/08/99	---	---	---	---	0	0	0	5	2,149	565	106
05/09/99	---	---	---	---	0	0	0	3	1,067	754	136
05/10/99	0	0	0	0	0	0	0	8	2,629	254	148
05/11/99	0	0	0	0	0	0	0	5	2,275	426	291
05/12/99	0	0	0	0	0	0	0	3	754	196	0
05/13/99	0	0	0	0	0	0	0	9	1,966	36	320
05/14/99	0	0	0	0	0	0	0	7	1,404	9	42,703
05/15/99	---	---	---	---	0	0	0	13	361	79	46,548
05/16/99	---	---	---	---	0	0	0	0	533	208	16,417
05/17/99	0	0	0	0	0	0	0	2	342	25	9,541
05/18/99	0	0	0	0	0	0	0	0	2,130	33	4,810
05/19/99	0	0	0	0	0	0	0	5	1,257	48	1,938
05/20/99	0	0	0	0	0	0	0	8	1,224	---	1,017
Total:	0	0	0	0	0	0	0	70	22,466	2,963	124,265
# Days:	10	10	10	10	14	14	14	14	14	13	14
Average:	0	0	0	0	0	0	0	5	1,605	228	8,876

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)
05/07/99	0	0	0	2	0	599	126	170	1,050	3,912	7,687
05/08/99	---	---	---	---	472	384	107	247	826	8,346	6,755
05/09/99	---	---	---	---	709	2,297	112	190	889	6,119	4,526
05/10/99	0	0	0	2	0	1,944	96	286	1,318	11,234	3,451
05/11/99	0	0	0	2	233	1,940	517	354	948	9,057	6,470
05/12/99	0	0	0	5	501	1,672	441	438	1,131	9,221	6,110
05/13/99	0	0	0	1	673	1,235	654	851	786	6,276	5,897
05/14/99	0	0	0	5	507	404	254	1,535	879	2,687	4,958
05/15/99	---	---	---	---	256	1,667	102	773	1,446	5,007	4,529
05/16/99	---	---	---	---	805	1,320	535	1,053	2,667	3,838	6,567
05/17/99	0	0	0	6	500	637	354	1,969	1,884	7,297	7,172
05/18/99	0	0	0	2	1,063	1,478	922	1,680	1,956	8,150	8,644
05/19/99	0	0	0	9	523	422	784	1,599	2,514	6,039	8,151
05/20/99	0	0	0	7	3,779	1,206	380	2,556	2,798	---	8,279
Total:	0	0	0	41	10,021	17,205	5,384	13,701	21,092	87,183	89,196
# Days:	10	10	10	10	14	14	14	14	14	13	14
Average:	0	0	0	4	716	1,229	385	979	1,507	6,706	6,371

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)
05/07/99	151	35	29	197	84,208	88,073	53,549	225	13,739	7,405	5,656
05/08/99	---	---	---	---	101,549	166,875	46,769	298	12,733	9,053	5,594
05/09/99	---	---	---	---	122,936	83,466	65,795	368	17,611	7,086	4,560
05/10/99	176	79	51	139	69,353	64,184	96,989	177	29,980	9,350	5,047
05/11/99	226	361	25	110	49,816	89,846	128,312	424	16,279	17,176	6,179
05/12/99	120	228	21	95	47,851	43,685	124,389	272	22,630	9,076	7,117
05/13/99	226	343	18	139	60,693	39,463	52,889	349	7,670	18,876	5,961
05/14/99	122	144	38	113	79,882	72,197	44,369	825	12,007	12,306	6,346
05/15/99	---	---	---	---	51,556	87,340	44,181	690	15,907	15,100	3,688
05/16/99	---	---	---	---	46,963	40,881	79,877	708	20,974	6,384	7,639
05/17/99	108	172	48	231	28,400	35,916	67,757	664	13,348	9,619	5,461
05/18/99	85	314	76	112	38,780	31,466	52,827	680	10,952	9,278	9,968
05/19/99	175	1,318	82	559	48,657	33,102	14,114	615	10,055	12,442	7,416
05/20/99	66	860	172	311	34,010	25,669	21,030	651	15,568	---	6,173
Total:	1,455	3,854	560	2,006	864,654	902,163	892,847	6,946	219,453	143,151	86,805
# Days:	10	10	10	10	14	14	14	14	14	13	14
Average:	146	385	56	201	61,761	64,440	63,775	496	15,675	11,012	6,200

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)
05/07/99	5	76	19	19	3,774	3,987	2,035	313	2,665	4,691	3,118
05/08/99	---	---	---	---	6,612	8,258	1,965	281	2,149	5,800	3,378
05/09/99	---	---	---	---	7,329	6,510	3,987	209	3,202	5,731	2,382
05/10/99	7	66	16	18	5,500	7,198	5,818	139	3,683	7,368	2,004
05/11/99	8	261	10	8	4,683	8,538	9,655	258	2,671	5,650	3,416
05/12/99	8	245	12	14	5,011	3,973	7,334	218	2,640	6,949	3,156
05/13/99	12	398	20	18	6,389	3,922	2,969	229	788	5,971	2,948
05/14/99	7	105	11	19	5,742	3,843	3,341	425	1,072	4,619	3,570
05/15/99	---	---	---	---	3,334	6,879	3,569	429	907	5,404	1,876
05/16/99	---	---	---	---	3,757	2,417	7,397	430	1,779	4,443	1,407
05/17/99	4	157	8	31	2,800	2,337	9,530	397	1,540	5,707	2,138
05/18/99	6	193	19	24	3,020	2,957	7,173	436	1,788	3,708	2,021
05/19/99	11	401	55	34	3,837	2,110	2,156	462	2,156	4,418	2,138
05/20/99	6	86	91	86	4,765	6,032	3,801	758	1,576	---	2,324
Total:	74	1,988	261	271	66,553	68,961	70,730	4,984	28,616	70,459	35,876
# Days:	10	10	10	10	14	14	14	14	14	13	14
Average:	7	199	26	27	4,754	4,926	5,052	356	2,044	5,420	2,563

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)
05/07/99	0	0	0	1	0	0	0	19	355	63	145
05/08/99	---	---	---	---	0	0	0	15	995	67	0
05/09/99	---	---	---	---	0	0	0	121	539	20	102
05/10/99	1	0	0	0	0	0	0	5	1,315	188	74
05/11/99	11	0	0	1	0	0	0	2	758	254	73
05/12/99	2	0	0	6	0	0	0	3	189	107	336
05/13/99	4	0	0	6	0	0	0	0	594	423	192
05/14/99	2	0	0	3	0	0	0	11	702	540	0
05/15/99	---	---	---	---	256	0	0	21	181	0	97
05/16/99	---	---	---	---	268	0	0	20	894	82	268
05/17/99	3	0	0	4	0	0	8	20	342	1,220	66
05/18/99	6	0	0	3	0	0	0	28	1,420	117	209
05/19/99	6	0	0	10	349	0	0	19	539	102	0
05/20/99	6	0	0	37	0	0	0	57	1,224	---	73
Total:	41	0	0	71	873	0	8	341	10,047	3,183	1,635
# Days:	10	10	10	10	14	14	14	14	14	13	14
Average:	4	0	0	7	62	0	1	24	718	245	117

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)
05/07/99	0	0	0	0	236	214	55	1,733	47,085	6,526	1,124
05/08/99	---	---	---	---	0	207	80	1,599	76,378	12,072	2,428
05/09/99	---	---	---	---	236	588	117	448	59,069	13,136	2,995
05/10/99	0	0	0	0	0	210	236	183	78,924	33,283	4,008
05/11/99	0	0	0	0	0	221	45	235	90,092	35,447	4,798
05/12/99	0	0	0	0	251	219	402	264	85,807	33,612	6,647
05/13/99	0	0	0	0	168	222	88	296	146,489	37,735	8,461
05/14/99	0	0	0	0	338	0	76	476	38,601	39,415	6,148
05/15/99	---	---	---	---	0	226	414	270	30,546	16,849	10,060
05/16/99	---	---	---	---	0	234	55	861	85,828	24,702	5,562
05/17/99	0	0	0	0	100	227	417	290	52,711	21,942	3,191
05/18/99	0	0	0	0	531	0	64	158	34,796	29,526	2,161
05/19/99	0	0	0	0	0	0	0	251	41,123	19,186	3,207
05/20/99	0	0	0	0	329	246	127	645	38,128	---	5,229
Total:	0	0	0	0	2,189	2,814	2,176	7,709	905,577	323,431	66,019
# Days:	10	10	10	10	14	14	14	14	14	13	14
Average:	0	0	0	0	156	201	155	551	64,684	24,879	4,716

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 20, 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	35,488	7,205	35,077	563	63,174	2,169	0	0	0	0	0	0	0	0	0	0	0	0
TDA	14,887	4,586	22,874	357	36,162	1,296	0	0	0	0	0	0	0	0	0	0	0	0
JDA	10,799	3,007	19,328	213	27,463	1,006	0	0	0	0	0	0	0	0	0	0	0	0
MCN	6,681	1,990	16,296	183	25,563	993	0	0	0	0	0	0	0	0	0	0	0	0
IHR	2,808	1,130	9,893	67	11,813	324	0	0	0	0	0	0	0	0	0	0	0	0
LMN	1,328	597	7,893	44	9,930	292	0	0	0	0	0	0	0	0	0	0	0	0
LGS	1,003	440	7,173	28	**	**	0	0	0	0	**	**	0	0	0	0	**	**
LWG	1,014	572	6,802	33	7,413	183	0	0	0	0	0	0	0	0	0	0	0	0
PRD	2,622	61	2,974	9	7,142	50	0	0	0	0	0	0	0	0	0	0	0	0
RIS	930	19	1,133	2	3,418	15	0	0	0	0	0	0	0	0	0	0	0	0
RRH	220	16	219	3	552	2	0	0	0	0	0	0	0	0	0	0	0	0
WEL	0*	0*	1	18	326	9	0	0	0	0	0	0	0	0	0	0	0	0

DAM	Coho						Sockeye			Steelhead			
	1999		1998		10-Yr Avg.		10-Yr Avg.			10-Yr Avg.			Wild
	Adult	Jack	Adult	Jack	Adult	Jack	1999	1998	Avg.	1999	1998	Avg.	1999
BON	0	0	0	0	0	0	0	0	0	1,818	2,096	4,040	274
TDA	0	0	0	0	0	0	0	0	1	434	807	1,704	95
JDA	0	0	0	0	0	0	0	0	1	3,099	5,013	2,962	945
MCN	0	1	0	1	0	0	0	0	1	402	1,426	2,455	107
IHR	0	0	0	0	0	0	0	0	0	790	1,785	2,735	297
LMN	0	0	0	0	0	0	0	0	0	596	1,549	2,417	119
LGS	0	0	0	0	**	**	0	0	**	902	2,019	**	301
LWG	0	0	0	0	0	0	0	0	0	3,026	4,329	5,637	531
PRD	0	0	0	0	0	0	3	0	3	13	13	47	0
RIS	0	0	0	0	0	0	0	0	1	15	28	83	14
RRH	0	0	0	0	0	0	0	0	0	36	81	58	10
WEL	0	0	0	0	0	0	0	0	0	1	2	20	0

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

* RIS, RRH are through 5/16, LGS is through 5/17, LMN is through 05/18 and PRD is through 5/19.

*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 Report
from 05/07/99 to 05/20/99**

	Yearling Chinook	Subyearling Chinook	Steelhead	Coho	Sockeye	Total
LOWER GRANITE DAM						
Collected	693,000	0	580,500	6,200	1,850	1,281,550
Bypassed	15,354	0	22,670	5	0	38,029
Trucked	0	0	0	0	0	0
Barged	672,480	0	557,687	6,191	1,818	1,238,176
Total Transported	672,480	0	557,687	6,191	1,818	1,238,176
LITTLE GOOSE DAM						
Collected	1,290,304	0	727,558	12,752	2,103	2,032,717
Bypassed	0	0	0	0	0	0
Trucked	0	0	0	0	0	0
Barged	1,284,059	0	727,275	12,750	1,932	2,026,016
Total Transported	1,284,059	0	727,275	12,750	1,932	2,026,016
LOWER MONUMENTAL DAM						
Collected	905,930	0	757,308	4,182	1,704	1,669,124
Bypassed	28,322	0	211	0	0	28,533
Trucked	0	0	0	0	0	0
Barged	877,395	0	757,028	4,186	1,704	1,640,313
Total Transported	877,395	0	757,028	4,186	1,704	1,640,313
M McNARY DAM						
Collected	863,556	12,600	139,025	11,857	506,859	1,533,897
Bypassed	863,237	12,596	138,989	11,852	506,640	1,533,314
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	3,752,790	12,600	2,204,391	34,991	512,516	6,517,288
Bypassed	906,913	12,596	161,870	11,857	506,640	1,599,876
Trucked	0	0	0	0	0	0
Barged	2,833,934	0	2,041,990	23,127	5,454	4,904,505
Total Transported	2,833,934	0	2,041,990	23,127	5,454	4,904,505

**Cumulative Transportation Summary Report
through 05/20/99**

	Yearling Chinook	Subyearling Chinook	Steelhead	Coho	Sockeye	Total
LOWER GRANITE DAM						
Collected	1,835,496	1,316	2,202,192	8,507	6,258	4,053,769
Bypassed	76,171	0	55,145	8	0	131,324
Trucked	29,736	126	23,030	183	1,219	54,294
Barged	1,718,083	1,190	2,123,509	8,302	4,828	3,855,912
Total Transported	1,747,819	1,316	2,146,539	8,485	6,047	3,910,206
LITTLE GOOSE DAM						
Collected	2,743,818	0	1,933,969	20,418	7,154	4,705,359
Bypassed	0	0	0	0	0	0
Trucked	1,001	0	1,128	5	120	2,254
Barged	2,729,902	0	1,932,126	20,404	6,467	4,688,899
Total Transported	2,730,903	0	1,933,254	20,409	6,587	4,691,153
LOWER MONUMENTAL DAM						
Collected	1,526,274	7	1,161,316	4,905	4,064	2,696,566
Bypassed	37,806	0	638	0	0	38,444
Trucked	3,464	6	899	0	28	4,397
Barged	1,482,406	0	1,159,398	4,909	3,965	2,650,678
Total Transported	1,485,870	6	1,160,297	4,909	3,993	2,655,075
M McNARY DAM						
Collected	1,579,192	57,074	282,404	13,913	589,304	2,521,887
Bypassed	1,577,704	57,027	282,339	13,901	589,036	2,520,007
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	7,684,780	58,397	5,579,881	47,743	606,780	13,977,581
Bypassed	1,691,681	57,027	338,122	13,909	589,036	2,689,775
Trucked	34,201	132	25,057	188	1,367	60,945
Barged	5,930,391	1,190	5,215,033	33,615	15,260	11,195,489
Total Transported	5,964,592	1,322	5,240,090	33,803	16,627	11,256,434