



## Fish Passage Center

# Weekly Report #99 - 13

June 04, 1999

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### SUMMARY OF EVENTS:

**Water Supply:** Light showers continue over the region. Temperatures are forecasted to decrease again during next week with gradually diminishing snowmelt. Minor precipitation increases were observed at Clark Fork region and Upper Snake basin during past week.

**System Storage:** The major system reservoirs are refilling toward the end of June, Opinion required, full pool elevations.

- Hungry Horse operated to the Integrated Rule Curves defined by the State of Montana. The reservoir is projected to be full by July 31, instead of June 30 as required by Biological Opinion, impacting flows for summer migrants. The outflows continue to be in the range of 2.8-3.35 kcfs during working days and 200 cfs during week-ends. The reservoir is currently operated to prevent floods below Columbia Falls.
- Libby continues to refill with a minimum outflow of 4 kcfs. The Sturgeon pulse is expected to commence once the temperatures at Bonners Ferry reach the required 45° F.
- Arrow reservoir decreased its outflow to 22-25 kcfs at the end of May because of the increased outflows from Kootenai Lake downstream of Arrow Dam. There is a requested outflow of 30 kcfs below Arrow for protecting trout redds, but because of the higher Kootenai river inflows, Arrow outflow is restricted. Trout redds are being protected because of the upstream backwater effect of the Kootenai River.
- Grand Coulee reservoir continues refilling. Inflows were in the range of 211 kcfs-217.6 kcfs during the week of May 28-June 3. Outflows were in the range of 99.8 kcfs-143.6 kcfs during the same period.

- Dworshak reservoir continues to refill with minimum outflows of 1.3 kcfs-1.4 kcfs since May 20. The latest projection of the SSARR shows the reservoir will not refill at all in 1999. The highest projected elevation is 1584 ft at the end of the second week of July before summer flow augmentation begins. Deep drafting of the reservoir for flood control during March resulted in a failure of the reservoir to refill by June 30 or July 31. It is expected that flows at Lower Granite during the whole month of August will be lower than the BiOp required minimum flow target of 53.96 kcfs.
- *Brownlee* reservoir was passing inflows in the range of 26 kcfs-46 kcfs during May 28-June 3. Inflows increased significantly during last week because of the snowmelt. The reservoir increased outflows to level of 36-46 kcfs during last week because of the required lower elevation for reparation of the spill gates. Currently, as of June 4, the reservoir will start refill toward an end of June full pool elevation.

A summary of the current elevations on June 3 is given in the following Table:

Reservoir	Actual elev. As of June 3	Max Reservoir pool [ft]
<i>Libby</i>	2390.8	2459
<i>Hungry Horse</i>	3518.5	3560
<i>Grand Coulee</i>	1245.3*	1290
<i>Brownlee</i>	2040.7*	2077
<i>Dworshak</i>	1517.6	1600

\*as of June 2

Upper Snake reservoirs:

As of June 3, American Falls is at 98% of capacity, Palisades is at 48% of full and Jackson Lake is 79% of full. All major reservoirs have been refilled because intensive snowmelt in the region resulting in higher flows at Minidoka of 20.5 kcfs. Higher temperatures initiated irrigation withdrawals at Milner diversion. Resulting flows downstream of Milner are 13.5 kcfs. The system is at 79% of capacity.

Boise and Payette River Basins:

Both systems are operated for flood control, but are also refilling. The Boise River system (Anderson Ranch, Arrowrock and Lucky Peak) is at 85% of capacity. The outflow from Boise River system is 1.8 kcfs (as of June 3).

The Payette River system (Cascade, Deadwood) is at 83% of capacity. The outflow from Payette river system is 10.5 kcfs (as of June 3).

**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. Moderate snowmelt finally resulted in peaking flows. Flows at Lower Granite fluctuated between 157.8 kcfs (on May 29) and 174.3 kcfs (on June 2) during the past week. It is expected that flows will recede during the coming week. McNary flows were fluctuating during the past week, from 336.6 kcfs on May 28 to 366.1 kcfs on June 2.

Daily average flows at Priest Rapids were fluctuating in the range of 156.5 kcfs to 190.4 kcfs. The total range of daily and hourly fluctuations is presented in the following Table:

Date	Average Daily Flow at Priest Rapids [kcfs]	Hourly fluctuations [kcfs]
May 28	171.2	160.6-189.9
May 29	179.4	162.1-205.7
May 30	156.5	149.0-179.4
May 31	162.1	150.8-182.6
June 1	176.4	172.6-201.8
June 2	189.0	177.0-202.7
June 3	190.4	160.6-209.1

The average discharge for the major run-of river projects for May 21-June 3 period are given in the following Table:

Project	Average Discharge [kcfs]	
	May 28-June 3	May 21-May 27
<i>Priest Rapids</i>	175.0	143.0
<i>McNary</i>	345.1	280.6
<i>Lower Granite</i>	167.0	139.8
<i>Bonneville</i>	367.2	302.4

**Spill:** Outflow from Dworshak Dam continued at project minimum with no spill occurring. Some spill occurred at the Hell's Canyon Complex this past week. The gate repairs at Brownlee required a lower pool elevation; therefore the projects were passing inflow and spilling. The repair work was completed and outflows have been reduced. The Biological Opinion spill program is presently being implemented at the lower Snake projects. The higher flows this past week have resulted in higher volumes of spill in the Snake River leading to higher dissolved gas levels.

The FERC spill program continues at the Mid Columbia projects.

Biological Opinion spill levels continue at the lower Columbia projects. The higher flows in the lower River have also resulted in correspondingly higher spill levels at these projects.

Towards the end of the week the levels of total dissolved gas were above 115/120% TDG waivers at all the Snake River monitors, except those above Lower Granite Dam. With the exception of the John Day forebay monitor and The Dalles monitors, all other lower River sites have periodically been out of compliance during the past week. These higher gas levels are due to uncontrolled spill at this time.

Monitoring for signs of gas bubble trauma (GBT) on fish collected through the Smolt Monitoring Program showed more fish with signs of GBT over the past week. However, the frequency of fin signs did not exceed the 15% criteria established by NMFS.

**Smolt Monitoring:** In general, an overall decreasing trend in wild and hatchery chinook, wild and hatchery steelhead, and coho was observed after the high passage indices that were reported last week. Hatchery chinook at Lower Granite decreased from near 10,000 fish at the beginning of the week to only 2,000 per day at week's end. Wild chinook numbers remained fairly stable over the past week with daily passage indices mostly in the 4,000 to 5,000 fish per day range. Hatchery steelhead passage indices decreased significantly to just over 20,000 on June 3<sup>rd</sup> at Lower Granite after peaking at over 306,000 on May 26<sup>th</sup>. Wild steelhead passage indices ranged between 4,000 and 9,000 over this past week. In most instances passage indices of both wild and hatchery chinook and steelhead were higher at Little Goose this past week than at Lower Granite. Hatchery sockeye passage indices increased at all the Snake River dam sampling sites, while wild sockeye passage indices were about the same as observed last week. Wild subyearling chinook were beginning to show up in higher numbers towards week's end.

The Lewiston and Whitebird traps have completed their sampling for the 1999 migration season and the Imnaha Trap has not been operating due to high flows and debris.

In the Mid-Columbia River, this week's daily passage indices of yearling chinook at Rock Island Dam remained about the same as last week, while those of coho, sockeye and steelhead showed an overall decreasing trend.

In the lower Columbia River, this week has seen McNary Dam's yearling chinook passage index decrease compared to last week. Coho and steelhead passage indices peaked on May 29<sup>th</sup> and then decreased after that date. Hatchery sockeye passage indices were higher than observed in the past several weeks, while wild sockeye passage indices continued to decline. At John Day and Bonneville dams, the trend in passage indices of yearling chinook showed decreasing numbers, with some increase occurring this week for coho at John Day and steelhead at John Day and Bonneville. Wild sockeye passage indices at both John Day and Bonneville dams continue to decline.

**Adult Fish Passage:** Summer chinook counts began June 1 at Bonneville Dam. Through June 3, the project counted 781 adult summer chinook past the project, with daily counts ranging between 217-298. So far, the summer chinook count is greater than the 1998 count but less than the 10-year average. The early segment of summer chinook at Bonneville is generally comprised of upper Snake River summer chinook, and the counts may include spring chinook that have been delayed due to high river Q or other reasons.

At Bonneville Dam, total adult spring chinook tallied through the end of May was 38,574. This total was nearly equal the 1998 count of 38,342, but was less than the 10-year average count of 66,607. Overall, the spring chinook run was greater than anticipated in some areas, such as the Bonneville pool tributaries (Wind River and Little White Salmon for example). Of the spring chinook past Bonneville, 17,563 have been counted at The Dalles Dam, 14,382 at John Day Dam, and 8,663 at McNary Dam. The conversion of fish from John Day Dam to above McNary Dam appears lower than normal based on a known number of fish counted into the Umatilla River to date of 1,540. About 45.5% of the spring chinook past Bonneville Dam have moved upstream past The Dalles Dam. This compares to the 10-year average of 59.5% and the 1998 percentage of about 65.8% of the Bonneville count moving upstream.

Through June 3, a total of 4,067 adult spring chinook were counted at the lower Snake River dam (Ice Harbor) with 1,965 adult spring chinook counted at Lower Granite Dam. In the Mid-Columbia River, 3,795 adult spring chinook have been counted at Priest Rapids Dam, with 2,741 passing Rock Island Dam by June 1. Trapping of spring chinook continues at Wells Dam.

As points of interest, 1431 adult and 175 jack spring chinook (Wild origin) have been counted at Prosser Dam in the Yakama River through May 28. This information was provided by Joel Hubble of the Yakama Tribe. At 3-Mile Dam in the Umatilla River, 1,540 adult spring chinook and 172 jack spring chinook have been tallied through June 3. ODFW provided this information.

The count of jack spring chinook is an all-time high record for the Umatilla River since re-introducing spring chinook in that basin.

At Lower Granite Dam, most adult chinook sampled through the week were reported in good condition with about 2.8% (10 of 357) displaying some type of lesion on the head area. This information was provided by NMFS.

The Columbia River Intertribal Fisheries Commission again sampled spring chinook at the Washington shore sampling facility this season. Through May 21, information from its sampling gave the following breakdown of percentage of run of each age class and mean length: jack chinook – 17% of run, ave. length = 49.2 cm; age 4 chinook – 73% of run, ave. length = 74 cm; age 5 chinook – 10% of run, ave. length = 84.6 cm. In addition, they monitor quality of fish at the site. Approximately 1% of the fish sampled were reported with headburn symptoms for the season. The percentage of chinook recorded with marine mammal wounds was 12% through May 21.

The passage of jack chinook at sites upstream of Bonneville Dam continues to be impressive. Of the 8,691 that passed Bonneville, 6,155 were tallied at The Dalles (70.8%), 4,864 at John Day, 3,699 at McNary Dam, 2,265 at Ice Harbor Dam and 572 at Priest Rapids Dam. Jack counts exceed the 10-year average at all projects and are at a record high according to our count totals going back to 1977. Prior to 1977, there were counts of jack chinook 10,000 for several year classes. However, the 4 and 5 year old chinook that return from the 1998 juvenile migration (1996 brood year) in year 2000 and 2001 could be impressive.

The first returns of adult sockeye were counted during the past week at Bonneville Dam and upstream projects.

**Hatchery Releases:** During the past two weeks, approximately 10 million anadromous salmon were released from hatcheries, acclimation ponds, or were directly planted into streams. For the upcoming two weeks, about 7.9 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. Basically, all spring migrants, i.e., yearling spring, summer, and fall chinook, coho and steelhead have been released from the hatcheries in each River Reach. Releases of subyearling bright fall chinook will be made during the next two weeks with mid-June to late-June being the peak time for releasing these fish. Subyearling summer chinook will be released in the Mid-Columbia in June.

Lower Columbia River (above Bonneville Dam to McNary Dam) –Subyearling fall chinook will be released during this month in the Klickitat, Little White Salmon, and Umatilla (completed June 3) rivers.

Mid-Columbia River - Most subyearling fall and summer chinook are scheduled for release in June. Approximately 2 million subyearling fall chinook are in the process of being released (volitional release) from the Prosser Acclimation Ponds located in the Yakama River. Normally the Priest Rapids subyearlings are released after a representative group of “wild” fall chinook in the Hanford Reach are marked with Coded Wire Tags.

Snake River – Approximately 565,000 subyearling fall chinook will be released in June from Big Canyon (Clearwater drainage) and CPT John (Snake River) acclimation facilities, with another 200,000 released into the Snake River Lyons Ferry Hatchery.

**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
05/21/99	116.7	0.0	120.4	0.0	121.4	11.2	124.0	23.2	128.5	41.0	136.5	27.2	152.5	114.4
05/22/99	100.2	0.0	94.9	0.0	104.6	11.1	105.8	20.8	109.6	40.8	104.8	21.2	125.4	94.2
05/23/99	103.8	0.0	111.3	0.0	125.0	26.3	118.2	19.6	122.4	40.9	98.4	19.8	111.0	83.4
05/24/99	108.0	0.0	106.5	0.0	134.2	14.2	141.2	24.4	154.4	40.9	135.1	27.3	133.7	100.5
05/25/99	104.0	0.0	109.9	0.0	140.5	13.3	145.6	14.3	159.9	34.3	128.7	24.5	136.4	102.0
05/26/99	120.0	0.0	124.4	0.0	146.7	11.4	155.4	12.4	168.0	30.3	157.4	25.4	163.3	123.6
05/27/99	128.1	0.0	121.6	0.0	145.4	11.5	154.8	0.0	170.0	30.3	167.6	27.8	178.6	133.7
05/28/99	121.8	0.0	132.9	0.0	149.8	12.6	152.4	0.0	164.6	32.8	161.3	24.5	171.2	128.7
05/29/99	99.8	0.0	103.6	0.0	140.8	13.0	149.7	0.0	162.9	35.8	165.5	24.9	179.4	134.3
05/30/99	115.7	0.0	123.1	0.0	142.5	12.1	144.1	0.0	153.7	35.8	148.2	22.4	156.5	118.1
05/31/99	132.8	0.0	122.8	0.0	146.3	12.5	149.2	0.0	161.9	35.9	148.3	22.6	162.1	122.0
06/01/99	143.6	0.0	149.7	0.0	167.7	12.6	164.2	1.3	173.1	35.9	165.9	24.8	176.4	132.3
06/02/99	135.1	0.0	142.7	0.0	172.2	13.8	173.2	1.0	189.0	35.8	178.8	26.9	189.0	141.9
06/03/99	165.2	0.0	152.7	0.0	170.3	15.5	167.4	0.0	173.4	30.2	173.8	27.9	190.4	143.3

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

Date	Dworshak		Brownlee Canyon		Lower Granite		Little Goose		Lower Monumental		Ice Harbor	
	Flow	Spill	Inflow	Outflow	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
05/21/99	1.3	0.0	36.5	34.5	94.4	34.8	89.8	21.9	91.3	17.6	98.3	65.8
05/22/99	1.3	0.0	38.0	27.1	113.6	44.3	107.5	22.2	113.3	19.8	117.4	66.1
05/23/99	1.3	0.0	39.8	26.3	115.7	35.0	111.5	22.7	115.5	19.9	116.4	70.0
05/24/99	1.3	0.0	43.0	30.6	131.4	42.3	124.9	26.5	131.0	19.2	132.2	72.9
05/25/99	1.3	0.0	44.7	33.3	154.8	56.2	144.5	37.4	150.9	34.4	157.1	80.2
05/26/99	1.4	0.0	47.2	40.6	181.2	78.8	172.8	73.6	184.5	62.4	178.5	107.0
05/27/99	1.4	0.0	45.6	15.4	187.5	84.6	178.5	63.3	186.1	66.1	195.9	125.9
05/28/99	1.5	0.0	43.7	14.8	161.4	58.8	153.9	39.5	150.7	35.8	162.1	91.1
05/29/99	1.5	0.0	39.6	30.3	157.8	57.9	149.8	37.5	156.9	35.1	160.0	82.0
05/30/99	1.5	0.0	41.6	41.3	172.1	71.6	164.1	49.9	172.5	49.8	174.3	92.2
05/31/99	1.4	0.0	40.9	47.0	172.7	68.7	162.8	47.1	172.7	50.8	175.7	95.6
06/01/99	1.4	0.0	43.9	45.9	169.2	65.6	160.4	43.7	168.5	45.3	171.2	89.2
06/02/99	1.5	0.0	40.0	38.1	174.3	70.4	165.5	46.3	176.6	53.2	178.6	102.2
06/03/99	1.4	0.0	---	26.6	161.7	60.3	155.5	42.0	164.4	43.2	168.6	94.3

**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		
05/21/99	274.0	121.9	285.2	101.7	278.0	83.0	286.7	93.8	81.3	102.4
05/22/99	249.0	108.6	269.2	55.6	259.6	147.0	271.7	93.0	77.5	92.0
05/23/99	252.4	111.0	258.3	55.1	256.7	163.0	282.7	93.2	77.5	102.8
05/24/99	237.8	96.7	248.7	54.8	243.8	153.0	268.4	92.6	76.0	90.6
05/25/99	302.3	134.7	305.2	103.6	291.8	102.0	298.1	92.2	83.7	113.0
05/26/99	310.2	144.5	338.3	106.6	335.5	101.7	336.7	113.2	82.5	131.8
05/27/99	338.6	218.9	375.9	112.5	362.6	123.0	372.4	144.0	83.7	135.5
05/28/99	352.8	183.2	381.8	112.2	376.1	190.0	384.3	156.1	84.4	134.7
05/29/99	333.7	167.2	369.2	102.5	362.1	210.0	371.3	143.1	85.1	133.9
05/30/99	328.6	175.0	368.0	99.0	364.7	206.0	362.2	132.3	86.1	134.6
05/31/99	344.4	189.6	348.8	102.7	333.6	118.0	352.3	123.8	85.8	133.5
06/01/99	336.4	169.0	353.9	119.0	346.2	104.0	355.6	131.7	84.3	130.4
06/02/99	360.7	193.4	376.9	112.5	355.5	108.0	365.6	138.9	85.4	132.1
06/03/99	359.3	191.0	376.9	116.8	365.0	197.0	378.8	155.8	82.3	131.5

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

### Total Dissolved Gas Saturation Data at Upper Columbia 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>Wells</u>				
	24 h		12 h	#	24 h		12 h	#	24 h		12 h	#	24 h		12 h	#	24 h		12 h	#	24 h		12 h	#
	Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High	
5/21	111	111	111	24	111	112	112	24	109	109	110	24	110	110	110	23	111	112	112	23	110	110	110	14
5/22	111	112	114	24	111	111	112	24	109	109	110	24	109	110	110	23	111	112	112	23	---	---	---	0
5/23	113	113	114	17	112	113	114	24	110	110	111	20	110	111	112	23	112	112	113	23	---	---	---	0
5/24	---	---	---	0	113	114	116	24	111	112	112	24	112	112	113	23	113	113	114	23	114	116	127	21
5/25	---	---	---	0	113	114	115	24	110	111	112	24	112	112	113	23	114	114	115	23	112	112	113	7
5/26	---	---	---	0	112	112	112	24	109	110	111	24	111	112	112	23	112	112	113	23	---	---	---	0
5/27	---	---	---	0	114	115	115	24	110	111	112	24	112	112	113	22	113	113	114	22	---	---	---	0
5/28	---	---	---	0	113	114	114	24	110	111	111	24	111	112	112	23	113	114	114	23	---	---	---	0
5/29	---	---	---	0	112	112	113	24	110	110	111	24	111	112	112	23	112	113	113	23	---	---	---	0
5/30	---	---	---	0	111	112	112	22	109	110	110	20	111	111	112	23	111	112	113	23	---	---	---	0
5/31	---	---	---	0	112	113	113	24	110	111	111	24	111	112	112	23	113	113	114	23	---	---	---	0
6/1	---	---	---	0	112	113	113	24	110	111	111	24	111	112	112	23	112	113	114	23	---	---	---	0
6/2	---	---	---	0	112	112	112	24	110	110	110	24	110	110	110	23	111	112	112	23	---	---	---	0
6/3	123	123	124	7	112	113	113	24	110	111	111	24	111	111	111	23	111	111	112	23	---	---	---	0

Note: Monitor for Canadian Boundary is misreading.

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

Date	<u>Rocky Reach</u>				<u>Tlwtr. Rocky R.</u>				<u>Rock Island</u>				<u>Tlwtr Rock Is.</u>				<u>Wanapum</u>				<u>Dnstrm Wanapum</u>			
	24 h		12 h	#	24 h		12 h	#	24 h		12 h	#	24 h		12 h	#	24 h		12 h	#	24 h		12 h	#
	Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High	
5/21	110	110	110	23	111	112	112	23	109	109	110	23	118	118	119	23	112	113	115	24	118	119	120	24
5/22	109	110	110	24	111	111	111	24	108	108	108	24	117	118	119	24	114	117	121	24	117	118	119	24
5/23	111	111	112	24	112	112	114	23	108	109	109	23	118	118	119	20	116	118	120	24	118	119	121	24
5/24	112	114	115	24	115	117	127	24	111	112	113	24	120	121	123	24	116	118	120	24	119	120	120	24
5/25	114	114	116	23	115	116	118	23	110	111	111	24	119	120	121	24	112	113	114	24	116	118	120	24
5/26	111	111	111	23	111	112	113	23	109	110	110	24	117	118	120	24	112	115	117	24	114	115	117	24
5/27	111	111	112	24	112	112	112	24	109	109	110	24	117	117	119	23	114	114	116	24	117	118	124	24
5/28	111	111	112	24	112	112	112	22	109	109	110	24	117	118	118	23	114	114	116	24	116	117	117	24
5/29	111	111	111	24	111	112	112	24	109	109	110	24	118	118	119	23	112	113	114	24	115	115	116	24
5/30	109	110	111	24	111	112	112	24	108	109	110	24	118	118	119	24	111	112	112	24	115	115	115	24
5/31	110	111	112	24	112	112	112	24	109	110	110	23	118	119	119	23	111	111	111	24	114	114	115	24
6/1	110	110	111	24	111	112	112	24	110	110	110	24	118	119	120	24	110	110	110	24	113	113	116	24
6/2	110	110	111	24	111	111	113	24	108	109	110	24	116	116	116	23	111	111	112	24	114	114	115	24
6/3	110	110	111	24	111	112	115	24	109	110	110	24	117	117	117	24	---	---	---	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>			
	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	
5/21	113	115	116	24	120	120	120	24	113	114	115	24	103	103	104	24	104	105	106	24	103	104	105	24
5/22	115	118	121	24	120	120	121	24	112	113	115	24	103	104	104	24	105	107	107	24	102	104	104	24
5/23	116	117	117	24	120	121	121	24	112	114	115	24	103	104	105	24	106	107	107	24	103	104	105	24
5/24	118	118	119	24	127	132	133	24	113	114	116	24	102	102	104	13	105	106	107	13	103	103	104	13
5/25	114	115	117	24	---	---	---	0	112	113	114	24	104	106	107	24	107	108	108	24	103	104	104	24
5/26	111	112	113	24	---	---	---	0	110	111	112	24	105	106	107	24	108	110	110	24	103	104	105	24
5/27	115	116	118	24	120	120	121	9	108	109	110	24	105	106	107	24	110	111	112	24	104	105	105	24
5/28	114	115	115	24	118	119	119	24	106	107	108	24	104	105	106	24	109	110	110	24	104	104	105	24
5/29	112	113	114	24	119	119	119	24	106	107	108	24	104	105	106	24	109	110	111	24	103	104	105	24
5/30	112	113	113	24	119	119	119	24	106	107	108	24	104	105	105	24	110	110	111	24	103	103	104	24
5/31	111	111	112	24	119	119	119	24	107	108	109	24	104	104	104	24	111	112	112	24	103	103	103	24
6/1	110	110	111	24	119	120	120	24	109	111	112	24	104	105	106	24	110	111	111	24	103	104	105	24
6/2	109	110	111	24	119	120	120	24	105	105	105	24	103	103	104	24	109	109	109	24	101	102	103	24
6/3	---	---	---	0	---	---	---	0	105	105	106	15	103	103	103	15	109	109	110	24	100	101	101	24

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

### Total Dissolved Gas Saturation Data at Snake River 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	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr
5/21	104	105	105	111	115	116	113	114	115	116	117	119	116	117	119	116	117	119
5/22	105	106	107	113	117	119	115	117	123	116	118	119	116	117	118	118	119	120
5/23	106	108	111	112	117	119	117	120	126	116	119	119	118	119	122	118	119	120
5/24	107	108	109	114	118	118	115	119	121	117	120	120	118	120	121	120	121	124
5/25	106	106	107	118	120	120	113	115	117	117	119	120	117	119	120	122	122	123
5/26	105	106	107	125	129	131	115	117	119	123	126	129	116	117	119	127	130	132
5/27	107	108	109	127	130	131	120	122	124	124	126	127	127	129	130	129	131	133
5/28	109	110	111	120	121	122	124	124	125	120	120	122	125	126	127	123	126	129
5/29	109	109	109	120	122	122	120	121	123	118	119	120	122	122	122	124	124	127
5/30	108	108	110	123	125	125	117	117	118	120	122	123	120	120	121	125	127	131
5/31	108	109	109	122	123	124	119	120	121	121	121	123	121	123	124	126	129	131
6/1	109	109	109	122	122	123	118	119	120	---	---	---	0	120	121	122	126	128
6/2	108	108	109	122	123	124	117	117	117	---	---	---	0	119	119	120	127	128
6/3	107	108	109	121	122	122	119	120	121	119	120	120	120	120	121	125	126	127

### Total Dissolved Gas Saturation Data at Lower Columbia River 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	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr
5/21	116	117	119	117	119	121	---	---	---	0	113	114	116	115	116	120	120	121
5/22	116	117	117	118	121	---	---	---	0	113	113	114	114	115	119	119	120	7
5/23	118	119	121	118	120	122	---	---	0	---	---	---	0	---	---	---	---	0
5/24	120	122	125	119	121	122	---	---	0	120	122	---	119	121	122	119	121	24
5/25	118	119	119	120	121	123	---	---	0	118	118	120	117	118	119	122	123	24
5/26	117	118	120	124	126	131	---	---	0	118	119	121	116	118	120	121	126	23
5/27	122	124	125	127	130	132	---	---	0	118	120	122	117	118	119	127	127	23
5/28	125	126	127	122	123	124	---	---	0	121	124	126	119	121	122	125	126	24
5/29	123	124	124	121	123	124	---	---	0	119	121	123	118	119	120	124	124	24
5/30	120	120	121	122	123	124	---	---	0	118	119	120	116	117	119	124	124	24
5/31	120	121	121	122	124	126	---	---	0	116	117	118	115	116	117	125	126	23
6/1	120	120	121	122	123	123	---	---	0	114	115	116	112	112	114	123	124	24
6/2	118	119	119	123	124	125	---	---	0	113	113	114	110	111	112	125	125	23
6/3	120	120	121	122	123	123	---	---	0	115	116	119	113	114	115	125	125	24

### 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>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	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr	Avg	Avg High	hr
5/21	110	110	110	121	121	122	110	111	111	114	115	116	112	112	112	115	116	116
5/22	110	112	114	115	119	120	111	112	113	118	120	121	112	113	114	115	116	117
5/23	112	113	115	116	119	120	111	113	114	120	120	121	116	117	118	117	118	119
5/24	113	113	114	117	119	119	112	113	114	120	120	120	119	119	120	119	119	120
5/25	113	113	114	121	122	122	109	110	111	116	117	120	113	114	116	115	116	118
5/26	112	112	114	122	122	123	111	113	114	115	116	117	112	113	114	117	118	119
5/27	112	112	113	122	122	123	113	113	114	116	117	118	116	116	116	120	121	121
5/28	112	113	114	122	123	123	111	112	112	117	118	118	114	115	116	120	120	121
5/29	116	116	117	123	123	124	112	113	114	118	119	120	114	114	114	118	119	119
5/30	118	118	118	122	123	123	113	114	115	119	120	121	114	115	116	118	119	119
5/31	117	118	118	121	122	122	113	113	114	118	119	121	115	115	116	119	119	119
6/1	114	115	116	121	122	123	112	112	113	115	116	118	113	114	115	118	119	119
6/2	111	111	112	122	122	123	111	111	112	115	116	116	113	113	114	119	119	120
6/3	109	109	110	121	121	121	110	110	111	118	118	119	112	112	113	119	119	120

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

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

<u>Date</u>	<u>Skamania</u>			<u>Camas\Wash.</u>				
	<u>24 h</u> <u>Avg</u>	<u>12 h</u> <u>Avg</u>	<u>#</u> <u>High hr</u>	<u>24 h</u> <u>Avg</u>	<u>12 h</u> <u>Avg</u>	<u>#</u> <u>High hr</u>		
5/21	113	115	117	23	114	115	117	23
5/22	114	114	115	19	114	116	117	24
5/23	116	116	117	23	115	116	117	24
5/24	118	118	119	23	117	119	121	24
5/25	114	116	117	23	115	116	117	24
5/26	114	115	116	23	114	116	117	23
5/27	118	119	120	23	117	118	119	24
5/28	117	118	119	23	118	118	119	24
5/29	115	116	116	23	117	117	118	24
5/30	115	116	117	23	116	117	117	24
5/31	116	116	117	23	117	117	118	24
6/1	115	116	116	23	116	116	117	24
6/2	114	114	114	23	116	117	118	24
6/3	114	115	115	22	116	117	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
<b>Lower Granite Dam</b>													
	05/31/99	Yearling Chinook	51	2	1	1.96%	0.00%	1	0	0	0	1	1.0
	05/31/99	Steelhead	100	2	0	0.00%	0.00%	0	0	0	0	2	1.0
<b>Little Goose Dam</b>													
	05/26/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0.0
	05/26/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0.0
	06/02/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0.0
	06/02/99	Steelhead	100	1	0	0.00%	0.00%	0	0	0	0	1	1.0
<b>Lower Monumental Dam</b>													
	05/31/99	Yearling Chinook	100	3	2	2.00%	0.00%	2	0	0	0	1	1.0
	05/31/99	Steelhead	100	6	4	4.00%	0.00%	3	1	0	0	2	1.0
<b>Ice Harbor Dam</b>													
	05/25/99	Yearling Chinook	84	3	0	0.00%	0.00%	0	0	0	0	3	1.0
	05/25/99	Steelhead	98	6	0	0.00%	0.00%	0	0	0	0	6	1.0
	05/28/99	Yearling Chinook	54	0	0	0.00%	0.00%	0	0	0	0	0	0.0
	05/28/99	Steelhead	100	7	0	0.00%	0.00%	0	0	0	0	7	1.0
	06/01/99	Yearling Chinook	56	1	1	1.78%	0.00%	1	0	0	0	0	0.0
	06/01/99	Steelhead	100	7	2	2.00%	0.00%	2	0	0	0	5	1.0
<b>McNary Dam</b>													
	05/27/99	Yearling Chinook	100	6	0	0.00%	0.00%	0	0	0	0	4	1.0
	05/27/99	Steelhead	100	4	0	0.00%	0.00%	0	0	0	0	4	1.0
	05/31/99	Yearling Chinook	100	11	3	3.00%	0.00%	2	1	0	0	7	1.0
	05/31/99	Steelhead	100	17	8	8.00%	0.00%	6	2	0	0	9	1.0
	06/03/99	Yearling Chinook	100	4	1	1.00%	0.00%	1	0	0	0	3	1.0
	06/03/99	Steelhead	87	5	2	2.29%	0.00%	2	0	0	0	4	1.0
<b>Bonneville Dam</b>													
	05/27/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0.0
	05/27/99	Steelhead	100	1	0	0.00%	0.00%	0	0	0	0	1	1.0
	05/31/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0.0
	05/31/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0.0
	06/03/99	Yearling Chinook	92	2	0	0.00%	0.00%	0	0	0	0	2	1.0
	06/03/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0.0
<b>Rock Island Dam</b>													
	05/27/99	Yearling Chinook	100	4	1	1.00%	0.00%	0	1	0	0	3	1.0
	05/27/99	Steelhead	100	1	0	0.00%	0.00%	0	0	0	0	1	1.0
	06/03/99	Yearling Chinook	100	7	7	7.00%	0.00%	5	2	0	0	1	1.0
	06/03/99	Steelhead	86	4	0	0.00%	0.00%	0	0	0	0	4	1.0

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

Hatchery	Species...	Migration	Year	Number		...Release Dates...		Release Site	River Name
				Released	Begin	..End			
<b>ODFW</b>									
<b>Big Canyon</b>	SU	Steelhead	1999	100,000	5/19/99	6/2/99		Big Canyon H	Grande Ronde River
<b>Wallowa</b>	SU	Steelhead	1999	106,750	5/12/99	5/26/99		Wallowa Acclim Pd	Grande Ronde River
		<b>Agency Total:</b>		<b>206,750</b>					
<b>Umatilla Tribe</b>									
<b>Imeques</b>	FA	Chinook	1999	1,682,000	06/03/99	6/3/99		Imeques Acclim Pd	Umatilla River
		<b>Agency Total:</b>		<b>1,682,000</b>					
<b>WDFW</b>									
<b>Klickitat</b>	FA	Chinook	1999	4,000,000	6/1/99	6/20/99		Klickitat H	Klickitat River
<b>Wells</b>	SU	Steelhead	1999	216,700	4/15/99	5/31/99		Methow R	Methow River
	SU	Steelhead	1999	105,000	4/20/99	5/31/99		Chewuch R	Methow River
	SU	Steelhead	1999	148,000	4/20/99	6/4/99		Winthrop H	Methow River
	SU	Steelhead	1999	105,000	5/1/99	5/31/99		Twisp R	Methow River
		<b>Agency Total:</b>		<b>4,574,700</b>					
<b>Yakima Tribe</b>									
<b>Clark Flat</b>	SP	Chinook	1999	231,220	3/18/99	6/1/99		Clark Flat Acclim Pd	Yakama River
<b>Cle Elum Slough</b>		Coho	1999	210,000	5/10/99	5/25/99		Cle Elem Slough	Yakama River
<b>Easton Pond</b>	SP	Chinook	1999	156,718	3/18/99	6/1/99		Easton Pd	Yakama River
<b>Jack Creek Pond</b>		Coho	1999	240,000	5/10/99	5/25/99		Jack Creek Acclim Pd	Yakama River
<b>Leavenworth</b>		Coho	1999	419,000	4/28/99	5/30/99		Leavenworth H	Wenatchee River
<b>Lost Creek</b>		Coho	1999	320,000	5/7/99	5/25/99		Naches R	Yakama River
<b>Prosser</b>	FA	Chinook	1999	79,000	5/25/99	6/3/99		Prosser Acclim Pd	Yakama River
	FA	Chinook	1999	1,690,000	6/2/99	6/3/99		Prosser Acclim Pd	Yakama River
<b>Stiles Pond</b>		Coho	1999	182,000	5/7/99	5/25/99		Naches R	Yakama River
		<b>Agency Total:</b>		<b>3,527,938</b>					
		<b>Total Release:</b>		<b>9,991,388</b>					

Hatchery Release Summary  
For the Next Two Weeks  
From 6/4/99 to 6/17/99

Hatchery	Species...	Migration Year	Number	...Release Dates...		Release Site	River Name	
			Released	Begin	End			
<b>Nez Perce Tribe</b>								
<b>Lyons Ferry</b>	FA	Chinook	1999	300,000	6/15/99	6/15/99	Big Canyon (Clearwater R)	Clearwater Rvr M F
	FA	Chinook	1999	265,000	6/15/99	6/15/99	Cpt John Acclim Pd	Snake River
			<b>Agency Total:</b>	<b>565,000</b>				
<b>WDFW</b>								
<b>Lyons Ferry</b>	FA	Chinook	1999	200,000	6/15/99	6/15/99	Lyons Ferry H	Snake River
<b>Priest Rapids</b>	FA	Chinook	1999	6,700,000	6/12/99	6/26/99	Priest Rapids H	Mid-Columbia River
<b>Wells</b>	SU	Chinook	1999	390,000	6/14/99	6/30/99	Wells H	Mid-Columbia River
			<b>Agency Total:</b>	<b>7,290,000</b>				
			<b>Total Release:</b>	<b>7,855,000</b>				

## 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)
05/21/99	119	0	2	244	49,000	116,597	40,850	286	116,011	53,777	9,138
05/22/99	---	---	---	762	55,987	63,607	29,144	318	89,892	71,132	7,790
05/23/99	---	---	---	513	69,013	144,648	36,350	407	94,690	57,463	8,646
05/24/99	---	---	2	513	48,727	120,735	30,300	453	100,562	39,577	7,435
05/25/99	---	---	3	203	40,837	116,925	52,045	276	88,391	67,488	6,765
05/26/99	---	---	0	---	38,599	116,855	68,075	245	115,215	52,775	15,720
05/27/99	---	---	0	---	17,267	41,916	32,711	187	66,680	31,060	11,760
05/28/99	---	---	0	---	9,834	27,789	34,623	362	32,873	27,119	13,070
05/29/99	---	---	---	---	3,939	21,403	15,059	328	68,898	26,723	15,743
05/30/99	---	---	---	---	3,200	13,580	12,275	405	80,639	27,470	10,168
05/31/99	---	---	0	---	2,814	11,057	7,807	322	38,904	21,719	15,875
06/01/99	---	---	0	---	1,613	6,066	3,625	306	22,612	18,798	7,705
06/02/99	---	---	0	---	2,225	5,261	1,837	291	11,321	15,767	4,820
06/03/99	---	---	0	---	1,911	3,110	2,375	196	8,757	22,308	4,356
<b>Total:</b>	119	0	7	2,235	344,966	809,549	367,076	4,382	935,445	533,176	138,991
<b># Days:</b>	1	1	10	5	14	14	14	14	14	14	14
<b>Average:</b>	119	0	1	447	24,640	57,825	26,220	313	66,818	38,084	9,928

### Wild Yearling Chinook

Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)
05/21/99	39	4	38	43	5,444	10,208	3,172
05/22/99	---	---	---	118	4,890	4,555	4,958
05/23/99	---	---	---	237	11,465	13,871	3,561
05/24/99	---	---	51	256	8,586	12,796	3,232
05/25/99	---	---	78	201	7,518	14,288	5,280
05/26/99	---	---	12	---	15,629	14,170	4,863
05/27/99	---	---	14	---	15,596	7,523	6,542
05/28/99	---	---	8	---	12,163	11,481	8,387
05/29/99	---	---	---	---	5,357	13,404	8,605
05/30/99	---	---	---	---	5,200	11,381	5,433
05/31/99	---	---	4	---	4,520	11,765	4,071
06/01/99	---	---	8	---	2,607	4,453	3,491
06/02/99	---	---	4	---	4,532	6,834	3,533
06/03/99	---	---	2	---	4,238	2,683	2,375
<b>Total:</b>	39	4	219	855	107,745	139,412	67,503
<b># Days:</b>	1	1	10	5	14	14	14
<b>Average:</b>	39	4	22	171	7,696	9,958	4,822

### Wild Subyearling Chinook

LGR (INDEX)	LGS (INDEX)	LMN (INDEX)
0	0	0
0	196	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
83	0	134
0	0	0
499	0	140
<b>582</b>	<b>196</b>	<b>274</b>
14	14	14
42	14	20

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)
05/21/99	0	0	0	0	0	0	0	14	1,281	246	1,296
05/22/99	---	---	---	0	0	0	0	12	1,486	15	1,423
05/23/99	---	---	---	0	0	0	0	15	1,255	0	918
05/24/99	---	---	0	0	0	0	0	29	2,936	203	546
05/25/99	---	---	0	0	0	0	0	42	2,665	23	690
05/26/99	---	---	0	---	0	0	0	88	6,167	45	834
05/27/99	---	---	0	---	0	0	0	107	15,666	76	1,215
05/28/99	---	---	0	---	0	0	0	110	18,744	1,068	622
05/29/99	---	---	---	---	0	0	0	106	19,331	3,296	1,447
05/30/99	---	---	---	---	0	0	0	109	26,508	6,439	1,722
05/31/99	---	---	0	---	0	0	0	91	25,815	6,388	2,439
06/01/99	---	---	0	---	0	0	0	46	30,646	4,303	2,404
06/02/99	---	---	0	---	0	0	0	75	30,081	5,814	3,819
06/03/99	---	---	0	---	0	0	0	79	71,820	9,110	2,156
<b>Total:</b>	0	0	0	0	0	0	0	923	254,401	37,026	21,531
<b># Days:</b>	1	1	10	5	14	14	14	14	14	14	14
<b>Average:</b>	0	0	0	0	0	0	0	66	18,172	2,645	1,538

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)
05/21/99	0	0	0	18	3,630	1,419	1,015	1,627	4,574	6,394	7,365
05/22/99	---	---	---	13	5,734	1,178	484	1,521	5,757	7,940	5,284
05/23/99	---	---	---	9	7,194	7,707	737	1,177	8,787	5,438	6,458
05/24/99	---	---	0	4	5,366	4,322	1,422	1,560	3,670	3,403	9,038
05/25/99	---	---	0	2	9,025	12,229	3,017	2,288	8,494	8,196	14,048
05/26/99	---	---	0	---	13,261	9,619	6,281	2,950	14,696	12,410	11,393
05/27/99	---	---	0	---	15,596	7,195	4,278	2,122	9,282	6,536	17,184
05/28/99	---	---	0	---	13,716	11,226	8,172	1,661	14,676	9,977	16,004
05/29/99	---	---	---	---	4,096	10,435	4,694	1,165	31,045	20,710	10,637
05/30/99	---	---	---	---	2,720	11,466	5,031	1,069	20,505	18,770	8,282
05/31/99	---	---	0	---	4,520	10,286	3,266	831	13,695	21,506	11,077
06/01/99	---	---	0	---	3,061	9,966	6,176	948	12,170	15,627	10,417
06/02/99	---	---	0	---	2,307	8,022	3,533	1,159	4,031	19,444	9,014
06/03/99	---	---	0	---	1,745	6,327	3,911	1,072	7,334	24,781	7,320
<b>Total:</b>	0	0	0	46	91,971	111,397	52,017	21,150	158,716	181,132	143,521
<b># Days:</b>	1	1	10	5	14	14	14	14	14	14	14
<b>Average:</b>	0	0	0	9	6,569	7,957	3,716	1,511	11,337	12,938	10,252

### 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)
05/21/99	45	342	362	418	63,023	74,604	20,552	428	10,783	14,874	5,728
05/22/99	---	---	---	343	96,966	51,932	24,428	304	8,728	19,297	4,945
05/23/99	---	---	---	524	127,685	104,629	43,473	266	16,328	10,363	5,152
05/24/99	---	---	565	774	171,296	134,844	51,821	361	14,134	9,481	5,082
05/25/99	---	---	615	546	211,882	144,742	102,958	474	22,472	12,866	4,349
05/26/99	---	---	145	---	306,184	189,021	134,733	1,028	28,495	24,763	3,454
05/27/99	---	---	69	---	182,415	191,944	153,237	2,689	22,477	15,789	3,775
05/28/99	---	---	54	---	69,872	156,248	164,942	1,930	15,325	19,120	4,090
05/29/99	---	---	---	---	40,648	95,229	83,704	1,316	96,851	17,527	3,744
05/30/99	---	---	---	---	35,039	69,644	35,417	908	63,782	39,664	3,690
05/31/99	---	---	30	---	37,947	51,139	29,374	598	47,147	47,270	5,678
06/01/99	---	---	29	---	15,104	25,531	31,284	553	30,637	35,104	6,040
06/02/99	---	---	63	---	31,556	28,881	17,663	355	16,747	40,227	9,327
06/03/99	---	---	40	---	22,936	13,555	13,410	300	7,772	40,880	12,530
<b>Total:</b>	45	342	1,972	2,605	1,412,553	1,331,943	906,996	11,510	401,678	347,225	77,584
<b># Days:</b>	1	1	10	5	14	14	14	14	14	14	14
<b>Average:</b>	45	342	197	521	100,897	95,139	64,785	822	28,691	24,802	5,542

### 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)
05/21/99	16	20	137	44	5,939	7,504	4,313	460	3,306	7,654	2,114
05/22/99	---	---	---	54	17,707	5,489	5,321	419	2,786	6,833	1,897
05/23/99	---	---	---	89	19,108	9,966	10,684	432	2,331	11,611	2,223
05/24/99	---	---	127	118	16,958	17,693	10,149	422	2,202	6,862	2,660
05/25/99	---	---	147	45	23,803	24,093	21,308	573	4,680	14,429	2,451
05/26/99	---	---	55	---	30,074	24,856	20,463	1,125	8,712	22,911	2,382
05/27/99	---	---	27	---	26,736	21,060	16,859	1,710	5,362	11,161	2,300
05/28/99	---	---	18	---	14,233	16,729	9,032	1,184	4,560	12,976	2,667
05/29/99	---	---	---	---	8,823	12,640	5,867	914	9,895	13,688	2,383
05/30/99	---	---	---	---	7,120	11,671	3,622	517	8,910	17,400	1,558
05/31/99	---	---	9	---	5,628	6,340	4,181	307	5,839	13,415	1,400
06/01/99	---	---	9	---	3,840	7,265	3,222	262	1,962	12,683	1,109
06/02/99	---	---	12	---	5,685	4,838	2,261	195	1,395	8,442	1,565
06/03/99	---	---	2	---	4,654	1,848	1,117	183	876	11,796	1,123
<b>Total:</b>	16	20	543	350	190,308	171,992	118,399	8,703	62,816	171,861	27,832
<b># Days:</b>	1	1	10	5	14	14	14	14	14	14	14
<b>Average:</b>	16	20	54	70	13,593	12,285	8,457	622	4,487	12,276	1,988

**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)
05/21/99	0	0	0	33	0	0	0	29	732	97	0
05/22/99	---	---	---	25	0	0	0	26	745	466	68
05/23/99	---	---	---	40	450	0	123	56	364	15	106
05/24/99	---	---	0	30	429	188	178	29	367	380	136
05/25/99	---	---	0	7	220	0	0	80	666	376	0
05/26/99	---	---	0	---	237	608	203	83	916	414	159
05/27/99	---	---	0	---	278	278	0	73	620	200	87
05/28/99	---	---	0	---	2,070	886	430	75	460	519	178
05/29/99	---	---	---	---	2,836	2,228	196	96	2,319	275	255
05/30/99	---	---	---	---	1,760	1,663	805	94	2,695	822	164
05/31/99	---	---	0	---	1,791	1,790	445	43	2,696	639	0
06/01/99	---	---	0	---	1,075	647	806	51	1,521	1,132	62
06/02/99	---	---	0	---	1,318	855	707	61	2,015	1,769	250
06/03/99	---	---	0	---	748	353	419	29	1,204	714	180
<b>Total:</b>	0	0	0	135	13,212	9,496	4,312	825	17,320	7,818	1,645
<b># Days:</b>	1	1	10	5	14	14	14	14	14	14	14
<b>Average:</b>	0	0	0	27	944	678	308	59	1,237	558	118

### 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)
05/21/99	0	0	0	0	165	232	127	103	35,872	15,166	3,273
05/22/99	---	---	---	0	337	212	484	313	24,333	25,934	3,048
05/23/99	---	---	---	0	0	407	246	139	22,420	15,791	1,482
05/24/99	---	---	0	0	0	232	355	76	42,205	12,546	2,660
05/25/99	---	---	0	0	220	599	189	154	30,167	14,939	2,209
05/26/99	---	---	0	---	0	0	0	241	25,434	11,090	3,652
05/27/99	---	---	0	---	0	608	503	118	40,242	11,412	2,951
05/28/99	---	---	0	---	518	242	215	105	46,143	10,556	3,645
05/29/99	---	---	---	---	315	426	196	93	13,334	11,827	4,340
05/30/99	---	---	---	---	80	424	604	100	17,407	8,906	2,296
05/31/99	---	---	0	---	256	473	148	42	12,133	6,814	2,079
06/01/99	---	---	0	---	165	223	134	20	8,475	7,700	1,479
06/02/99	---	---	0	---	0	196	0	28	4,033	5,492	1,440
06/03/99	---	---	0	---	0	193	279	11	5,695	3,806	763
<b>Total:</b>	0	0	0	0	2,056	4,467	3,480	1,543	327,893	161,979	35,317
<b># Days:</b>	1	1	10	5	14	14	14	14	14	14	14
<b>Average:</b>	0	0	0	0	147	319	249	110	23,421	11,570	2,523

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 June 3, 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	38,574	8,691	38,342	775	66,607	2,467	781	227	492	25	1,038	71	0	0	0	0	0	0
TDA	17,563	6,155	25,225	518	39,636	1,617	0	0	0	0	0	0	0	0	0	0	0	0
JDA	14,382	4,864	21,516	363	30,887	1,299	0	0	0	0	0	0	0	0	0	0	0	0
MCN	8,663	3,699	18,381	287	29,035	1,397	0	0	0	0	0	0	0	0	0	0	0	0
IHR	4,067	2,265	11,270	102	14,650	541	0	0	0	0	0	0	0	0	0	0	0	0
LMN	2,685	2,106	8,892	71	13,090	568	0	0	0	0	0	0	0	0	0	0	0	0
LGS	2,208	1,962	8,087	55	**	**	0	0	0	0	**	**	0	0	0	0	**	**
LWG	1,965	1,649	7,413	51	10,625	344	0	0	0	0	0	0	0	0	0	0	0	0
PRD	3,795	572	3,792	21	8,987	124	0	0	0	0	0	0	0	0	0	0	0	0
RIS	2,741	485	2,630	33	6,243	93	0	0	0	0	0	0	0	0	0	0	0	0
RRH	1,034	77	602	24	1,338	18	0	0	0	0	0	0	0	0	0	0	0	0
WEL	*0	*3	1	21	660	19	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
	Adult	Jack	Adult	Jack	Adult	Jack	1999	1998	Avg.	1999	1998	Avg.	1999
BON	0	0	0	0	0	0	1	10	21	2,707	3,215	5,519	368
TDA	0	0	0	0	0	0	2	2	8	664	1,128	2,041	103
JDA	0	0	0	0	0	0	1	0	6	3,595	5,447	3,225	992
MCN	0	1	0	0	0	0	0	0	2	549	1,611	2,646	122
IHR	0	0	0	0	0	0	0	0	0	805	1,795	2,773	305
LMN	0	0	0	0	0	0	0	0	0	596	1,575	2,448	119
LGS	0	0	0	0	**	**	0	0	**	923	2,032	**	312
LWG	0	0	0	0	0	0	0	0	0	3,035	4,338	5,468	542
PRD	0	0	0	0	0	0	7	0	29	27	23	69	0
RIS	0	0	0	0	0	0	2	0	4	18	34	109	22
RRH	0	0	0	0	0	0	0	0	0	37	89	74	14
WEL	0	0	0	0	0	0	0	0	0	2	6	30	4

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

\*LMN and PRD are through 6/2 - LGS, MCN, RIS, and RRH are through 6/1.

\*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.



**Transportation Summary Report**  
**Two-Week Transportation Summary**  
 from 05/21/99 to 06/03/99

	Yearling Chinook	Subyearling Chinook	Steelhead	Coho	Sockeye	Total
<b>LOWER GRANITE DAM</b>						
Collected	286,401	350	1,008,250	56,300	9,350	1,360,651
Bypassed	38,578	0	208,682	14,600	1,640	263,500
Trucked	0	0	0	0	0	0
Barged	246,108	350	799,250	41,564	7,542	1,094,814
<b>Total Transported</b>	<b>246,108</b>	<b>350</b>	<b>799,250</b>	<b>41,564</b>	<b>7,542</b>	<b>1,094,814</b>
<b>LITTLE GOOSE DAM</b>						
Collected	714,760	150	1,084,162	80,901	10,047	1,890,020
Bypassed	19,783	0	158,018	4,195	299	182,295
Trucked	0	0	0	0	0	0
Barged	686,102	150	924,101	76,593	9,269	1,696,215
<b>Total Transported</b>	<b>686,102</b>	<b>150</b>	<b>924,101</b>	<b>76,593</b>	<b>9,269</b>	<b>1,696,215</b>
<b>LOWER MONUMENTAL DAM</b>						
Collected	328,550	200	747,700	37,750	5,750	1,119,950
Bypassed	110,696	0	250,073	7,795	595	369,159
Trucked	0	0	0	0	0	0
Barged	217,162	200	497,229	29,955	5,148	749,694
<b>Total Transported</b>	<b>217,162</b>	<b>200</b>	<b>497,229</b>	<b>29,955</b>	<b>5,148</b>	<b>749,694</b>
<b>MCNARY DAM</b>						
Collected	492,560	119,862	230,632	78,693	177,533	1,099,280
Bypassed	491,718	119,803	230,530	78,670	177,255	1,097,976
Trucked	0	0	0	0	0	0
Barged	0	0	0	0	0	0
<b>Total Transported</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>PROJECT TOTALS</b>						
Collected	1,822,271	120,562	3,070,744	253,644	202,680	5,469,901
Bypassed	660,775	119,803	847,303	105,260	179,789	1,912,930
Trucked	0	0	0	0	0	0
Barged	1,149,372	700	2,220,580	148,112	21,959	3,540,723
<b>Total Transported</b>	<b>1,149,372</b>	<b>700</b>	<b>2,220,580</b>	<b>148,112</b>	<b>21,959</b>	<b>3,540,723</b>

**Transportation Summary Report  
Cumulative Transportation Summary  
through 06/03/99**

	Yearling Chinook	Subyearling Chinook	Steelhead	Coho	Sockeye	Total
<b>LOWER GRANITE DAM</b>						
Collected	2,121,897	1,666	3,210,442	64,807	15,608	5,414,420
Bypassed	114,749	0	263,827	14,608	1,640	394,824
Trucked	29,736	126	23,030	183	1,219	54,294
Barged	1,964,191	1,540	2,922,759	49,866	12,370	4,950,726
<b>Total Transported</b>	<b>1,993,927</b>	<b>1,666</b>	<b>2,945,789</b>	<b>50,049</b>	<b>13,589</b>	<b>5,005,020</b>
<b>LITTLE GOOSE DAM</b>						
Collected	3,458,578	150	3,018,131	101,319	17,201	6,595,379
Bypassed	19,783	0	158,018	4,195	299	182,295
Trucked	1,001	0	1,128	5	120	2,254
Barged	3,416,004	150	2,856,227	96,997	15,736	6,385,114
<b>Total Transported</b>	<b>3,417,005</b>	<b>150</b>	<b>2,857,355</b>	<b>97,002</b>	<b>15,856</b>	<b>6,387,368</b>
<b>LOWER MONUMENTAL DAM</b>						
Collected	1,854,824	207	1,909,016	42,655	9,814	3,816,516
Bypassed	148,502	1	250,713	7,795	596	407,607
Trucked	4,879	6	1,133	0	88	6,106
Barged	1,699,568	200	1,656,627	34,864	9,113	3,400,372
<b>Total Transported</b>	<b>1,704,447</b>	<b>206</b>	<b>1,657,760</b>	<b>34,864</b>	<b>9,201</b>	<b>3,406,478</b>
<b>M McNARY DAM</b>						
Collected	2,071,752	176,936	513,036	92,606	766,837	3,621,167
Bypassed	2,069,422	176,830	512,869	92,571	766,291	3,617,983
Trucked	0	0	0	0	0	0
Barged	0	0	0	0	0	0
<b>Total Transported</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>PROJECT TOTALS</b>						
Collected	9,507,051	178,959	8,650,625	301,387	809,460	19,447,482
Bypassed	2,352,456	176,831	1,185,427	119,169	768,826	4,602,709
Trucked	35,616	132	25,291	188	1,427	62,654
Barged	7,079,763	1,890	7,435,613	181,727	37,219	14,736,212
<b>Total Transported</b>	<b>7,115,379</b>	<b>2,022</b>	<b>7,460,904</b>	<b>181,915</b>	<b>38,646</b>	<b>14,798,866</b>