



## Fish Passage Center

# Weekly Report #99 - 6

April 16, 1999

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### SUMMARY OF EVENTS:

#### **Water Supply:**

Precipitation during April 1-14 period was below normal in most of the basin. Minimum precipitation was recorded at Flathead, 24% of normal, and Clark Fork with 27% of normal. Relatively high precipitation was recorded in Snake Basin, in the range of 74%-98%. Precipitation above Coulee was 53% of normal. The cumulative precipitation for October-April period decreased compared with the previous period of October-March: total for the Columbia River above The Dalles is 113% and for the Snake River above Ice Harbor is 108%.

**System Storage:** The system continues to be operated for flood control with special operations for maintenance purposes. On April 20, federal regulators are obligated to meet Biological Opinion reservoir elevations in order to assure reservoir refill by June 30.

Hungry Horse continues to be drafted below the end of April flood control elevation for maintenance work. The reservoir will be managed with an outflow of 145 cfs during the weekend, and 3.2 kcfs during weekdays.

Libby continues at a minimum outflow of 4 kcfs. The COE decided at the beginning of March to operate Libby at minimum outflow in order to refill the reservoir to an end of April elevation that will enable the refill of the pool by June 30, while meeting requirements for sturgeon spawning flows. The reservoir was drafted to flood control elevations during the January through February period. The failure to refill the reservoir by April 20, as anticipated in the biological opinion, result in shifting some of the spring runoff volume into summer operations. The project is not projected to refill to full until the end of the first week of July.

Arrow reservoir continues to be operated with

a steady outflow of 20 kcfs to limit trout spawning areas during April-May period. This operation and low precipitation continue to affect inflows to Grand Coulee. The reservoir draft from 1237.6 ft on April 9 to 1232.1 ft on April 15, resulted in a more steady outflow during the past week (in the range of 102.3 kcfs to 108.6 kcfs) compared with the previous week.

Dworshak reservoir is passing inflow at elevation of 1445.4 ft-1445.6 ft.

Brownlee reservoir continues to be drafted to the end of April flood control elevation. Inflows in the mid-Snake remain at 35-38 kcfs for the second week in a row. Outflows at Hells Canyon Dam are in the range of 40 kcfs-44 kcfs, still requiring spill.

A summary of the current elevations on April 15 with BiOp required elevations on April 20 and end of April flood control elevations are given in the following Table:

Reservoir	Actual elev. as of April 15 [ft]	Max Reservoir pool [ft]	April 20 BiOp required/End of April Flood Control Elev. [ft]	
Libby	2324.47	2459	2332.9	2339.8
Hungry Horse	3483.14	3560	3497.8	3491.0
Grand Coulee	1232.10	1290	1228.2	1220.2
Brownlee	1993.4	2077	1992.8	1976.0
Dworshak	1445.32	1600	1445.0	1445.0

#### Upper Snake reservoirs:

Currently all reservoirs continue to be operated for flood control. As of April 15, BOR has refilled American Falls to 93% of full, and continues to draft Palisades as required for flood control to 30% of full (from 35% of full on April 8). Intensive drafting of Palisades for flood control resulted in flows at Milner of 12.4 kcfs, similar to the previous week. The system is at 67% of capacity.

Boise and Payette River Basins:

The reservoirs are conservatively drafted for flood control. Boise River system (Anderson Ranch, Arrowrock and Lucky Peak) is at 38% of capacity. Payette River system (Cascade, Deadwood) is at 47% of capacity.

**Streamflow:** The spring flow target based on the April Final Runoff Volume Forecast are 100 kcfs at Lower Granite and 260 kcfs at McNary. The COE's SSARR projections are showing that seasonal spring flow targets at both projects will be met during the entire spring season. Currently, flow targets at both projects were not met during the past two weeks. The most recent SSARR of April 12 shows that flow targets will not be met at Lower Granite until April 19 and at McNary until April 27.

Flows at Priest Rapids were fluctuating from 135.0 kcfs to 103.5 kcfs during April 9-15. Average daily flows fluctuated from 135 kcfs on April 9 to 105.3 kcfs on April 10, to 134 kcfs on April 13. Hourly flows at Priest Rapids continue to exhibit significant fluctuations as in the previous week. Flows decreased from 151.9 kcfs at 2100 to 121.2 kcfs at 2400, on April 9. Recovery of the flows was later, and at slower rate than flow decreases. Flows also decreased rapidly from 120.7 kcfs at 0100 to 68.5 kcfs at 0400 on April 10. A similar pattern was observed of the previous week where flows were rapidly decreasing in the period of 3-4 hours with slow recovery. The total range of daily hourly fluctuations is presented in the following table:

Date	Average Daily Flow at Priest Rapids [kcfs]	Hourly fluctuations [kcfs]
April 9	135.0	121.3-153.5
April 10	105.3	63.9-156.3
April 11	113.0	63.1-156.4
April 12	117.8	97.2-135
April 13	134.0	121.0-156.1
April 14	127.5	122.6-129.0
April 15	111.1	96.6-128.5

Flows at McNary and Lower Granite continue to be below required BiOp spring flow targets for the second consecutive week. The average discharge for the major run-off projects for April 2-15 period are given in the following Table:

Project	Average Discharge [kcfs]	
	April 9-15	April 2-8
<i>Priest Rapids</i>	120.5	146.6
<i>McNary</i>	205.0	240.8
<i>Lower Granite</i>	77.3	80.79
<i>Bonneville</i>	223.3	261.9

The fishery agencies requirement to meet the minimum flow request at Bonneville Dam during the entire fall season has been met. Hourly flows have been fluctuating below Bonneville at higher than requested levels and a few instance of stranded fall chinook, coho and chum juveniles have been noted.

**Spill:** No spill occurred at Dworshak Dam over the past week. Spill continues at the Hells Canyon complex due to high inflows to Brownlee and the need to achieve its end of April flood control elevation. In the Mid Columbia spill occurred at Wells Dam. Spill for fish passage was initiated on the evening of April 2<sup>nd</sup> at Lower Granite, Little Goose and Lower Monumental Dams. Spill at Ice Harbor was initiated the following evening.

Last week the fishery agencies and tribes submitted a System Operational Request for spill to begin in the lower Columbia. However, due to system conditions BPA could not implement the SOR and proposed alternatives for implementation of spill prior to the April 20 planning date specified in the Biological Opinion. The fishery agencies and tribes continue to support the SOR submitted, but given the system constraints recommended an alternative proposed by BPA that provided the greatest protection for fish. Subsequently, spill for fish passage was initiated at McNary Dam at 1800 hours on April 11, at John Day Dam at 1800 hours on April 12, at The Dalles Dam at 1800 hours on April 13 and at Bonneville Dam at 1800 hours on April 14. At McNary Dam spill levels are 50 kcfs for 24 hours daily; at John Day Dam spill equals 35% of instantaneous flow for 12 nighttime hours; at The Dalles Dam spill equals 30% of instantaneous flow

for 24 hours daily; and, at Bonneville Dam spill equals 50 kcfs for 24 hours daily.

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

**Smolt Monitoring.** In the Snake River basin, passage indices of hatchery chinook and hatchery steelhead have been rising quickly this week at each of the Snake River dams. Wild chinook passage indices also have increased rapidly from last week's level at Little Goose and Lower Monumental dams, but have showed only minor change at Lower Granite Dam. Wild steelhead passage indices have been quite variable over the past two weeks and have not shown any strong trend.

In the Columbia River basin, this week of sampling at Rock Island Dam produced many more chinook fry (fish less than or equal to 60 mm) and yearling chinook than was observed last week. This week's McNary Dam passage indices of yearling chinook and hatchery steelhead have dropped from last week's levels, with the most dramatic drop occurring for hatchery steelhead. Yearling chinook predominated in the collections at McNary Dam as well as in the collections downstream at John Day Dam this week. Yearling chinook and coho predominated in the collections at Bonneville Dam as hatchery steelhead numbers dropped to less than half of last week's level. Wild steelhead passage indices at the lower Columbia River dams have changed little from last week's level. Salmonid movement in the lower Columbia River appears to have slowed this week possible due to this week's lower weekly average flow (flow averaged 213 kcfs at The Dalles Dam this week, 83% of last week's level).

**Adult Fish Passage:** Adult fish counting is ongoing at mainstem Corps of Engineer projects on a 16-h per day basis (for reporting purposes). Fish counting began on April 15 at the Mid-Columbia projects except for Wells Dam where counting will start on May 1. Adult fish counts from the Mid-Columbia projects will be reported starting in next

week's Report. With few exceptions, adult fish passage facilities at COE and PUD projects were operating at or near full criteria through the week. One of the two north shore entrance gates at Lower Granite Dam will require maintenance work as the cables holding the gate in place snapped. The project has begun preliminary scheduling for diving and repair of the gate.

At Bonneville Dam, daily passage counts of spring chinook increased throughout the week, but still remained well below the 1998 and 10-year average count. Through (April 15), 3,036 adult spring chinook have been counted, and this total was about 37% and 21% of the respective 1998 and 10-year average. The high daily count occurred on April 15 when 482 adult chinook were tallied. Of the chinook past Bonneville, 368 [12% of the Bonneville total] have been reported at The Dalles Dam, 75 at John Day Dam, and 19 at McNary Dam. Through April 15, only 8 adult chinook have been counted at the lower Snake River dam (Ice Harbor) with no adult spring chinook counted at Lower Granite Dam to date.

At Bonneville Dam, the daily passage of steelhead was about 28 per day for the past week with the cumulative count for the season at 780. Of this total, 15% or 117 were "wild" origin steelhead. At Lower Granite Dam, steelhead passage since March 1 totaled 2,743, about 71% and 59% of the respective 1998 and 10-year average. Of the total, 377 were recorded as being "wild" steelhead (about 13.7% of the run).

**Hatchery Releases:** The Hatchery Release Tables show the number of fish released from Columbia River basin hatcheries during the past two weeks and for the upcoming two weeks. During the past two weeks, approximately 24 million anadromous salmon were released from hatcheries, acclimation ponds, or were directly planted into streams. For the upcoming two weeks, about 17.8 million salmon are scheduled for release from basin hatcheries into the rivers and tributaries above Bonneville Dam. Greater than 79 million juvenile salmon of hatchery origin were scheduled for release into streams above Bonneville Dam for the 1999 Migration Year.

**Lower Columbia River (above Bonneville Dam to McNary Dam)** – Release of yearling spring chinook from Klickitat Hatchery, Umatilla River acclimation ponds, and from Warm Springs NFH have been made to date. Carson, Little White Salmon, Round Butte, and other acclimation facilities are expected to release spring chinook next week. Approximately 3 million coho salmon were released in the Umatilla and Klickitat rivers during the past two weeks. Coho will be released volitionally made from Klickitat Hatchery as normal, with Willard Hatchery scheduled to release 2.1 million coho into the Little White Salmon River. Yearling fall chinook were released in March in the Umatilla River with another release ongoing through the week from Thornhollow Acclimation Pond in the Umatilla River. Steelhead releases were started or have been completed in the Umatilla, Hood, Deschutes rivers with releases scheduled for other streams in the lower rivers.

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

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

and summer chinook releases are complete and totals will be finalized in the next few weeks. Large numbers of steelhead were released from hatcheries and acclimation ponds during the week or are scheduled for release during the next two weeks. Yearling fall chinook have been released into the Snake River from Lyons Ferry Hatchery with the fish in the acclimation sites upriver in the Clearwater and Snake River slated to be in the rivers by mid-April.

**Daily Average Flow and Spill (in kcfs) at Mid-Columbia Projects**

Date	Grand Coulee		Chief Joseph		Wells		Rocky Reach		Rock Island		Wanapum		Priest Rapids	
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
04/02/99	124.7	0.0	128.1	0.0	130.2	0.0	136.1	0.0	135.0	0.0	137.5	0.0	143.1	0.0
04/03/99	121.6	0.0	120.4	0.0	123.3	0.0	130.9	0.0	131.6	0.0	135.6	0.0	136.0	0.0
04/04/99	143.6	0.0	149.5	0.0	142.8	0.0	148.8	0.0	145.9	0.0	142.8	0.0	140.3	0.0
04/05/99	140.4	0.0	144.3	0.0	146.8	0.0	150.9	0.0	151.0	0.0	153.4	0.0	157.1	0.0
04/06/99	131.6	0.0	137.3	0.0	140.7	0.0	149.1	0.0	149.5	0.0	151.3	0.0	152.1	0.0
04/07/99	127.4	0.0	131.0	0.0	134.8	0.0	142.7	0.0	142.9	0.0	143.8	0.0	149.0	0.0
04/08/99	89.4	0.0	94.0	0.0	111.5	1.7	120.0	0.0	120.3	0.0	143.7	0.0	148.3	0.0
04/09/99	102.3	0.0	96.0	0.0	111.1	6.3	118.3	0.0	118.5	0.0	129.7	0.0	135.0	0.0
04/10/99	108.6	0.0	110.9	0.0	106.2	6.3	110.9	0.0	107.4	0.0	99.7	0.0	105.3	0.0
04/11/99	104.2	0.0	116.0	0.0	106.4	6.8	109.2	0.0	110.1	0.0	111.5	0.0	113.0	0.0
04/12/99	108.6	0.0	111.9	0.0	125.2	9.3	130.8	0.0	128.1	0.0	126.0	0.0	117.8	0.0
04/13/99	105.1	0.0	109.5	0.0	115.6	11.3	119.6	0.0	119.1	0.0	127.5	0.0	134.0	0.0
04/14/99	102.6	0.0	106.1	0.0	108.2	11.3	111.9	0.0	112.2	0.0	116.8	0.0	127.5	0.0
04/15/99	104.1	0.0	100.9	0.0	95.6	11.0	91.2	0.0	94.5	0.0	114.7	0.0	111.1	0.0

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

Date	Dworshak		Brownlee		Lower Granite		Little Goose		Lower Monumental		Ice Harbor	
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill
04/02/99	16.0	5.6	---	---	86.3	13.7	86.7	12.4	90.9	8.5	92.6	1.3
04/03/99	12.0	1.7	---	---	89.2	27.5	93.0	24.8	100.3	17.1	101.3	26.4
04/04/99	10.3	0.0	---	---	83.3	26.5	80.3	20.6	86.1	16.5	91.5	60.2
04/05/99	10.3	0.0	---	---	79.6	30.6	76.5	24.0	81.9	16.9	85.9	59.7
04/06/99	10.3	0.0	---	---	76.9	29.8	72.1	24.6	75.4	16.8	77.9	57.1
04/07/99	10.4	0.0	---	---	75.7	31.8	71.6	25.2	74.2	18.1	77.7	57.5
04/08/99	9.8	0.0	---	---	74.5	32.4	72.1	28.3	76.5	17.9	80.5	59.3
04/09/99	8.0	0.0	---	---	75.0	31.7	70.5	24.4	74.2	19.3	78.8	60.6
04/10/99	5.5	0.0	---	---	76.4	33.2	72.1	24.7	76.9	19.1	82.1	59.4
04/11/99	4.7	0.0	---	---	72.8	33.6	68.7	24.5	71.7	18.7	76.4	56.5
04/12/99	5.4	0.0	---	---	75.3	34.3	73.1	28.0	72.0	18.8	76.0	51.7
04/13/99	7.1	0.0	---	---	79.6	35.2	77.3	25.1	82.0	19.1	82.7	62.7
04/14/99	7.4	0.0	---	---	81.7	35.2	78.6	24.8	81.7	18.6	86.0	62.3
04/15/99	8.3	0.0	---	---	80.2	35.3	76.6	26.1	81.6	19.3	86.9	63.7

**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		
04/02/99	260.3	80.1	270.2	7.3	271.3	0.0	277.5	48.0	82.8	137.5
04/03/99	239.7	60.1	255.4	0.0	256.4	0.0	256.4	34.4	75.2	137.6
04/04/99	222.3	44.3	260.8	0.0	266.0	0.0	273.0	50.0	74.6	139.2
04/05/99	226.3	50.1	246.2	0.0	244.8	0.0	269.9	49.3	72.4	139.0
04/06/99	247.4	71.5	247.9	0.0	248.9	0.0	265.6	41.1	77.9	137.4
04/07/99	240.4	67.6	244.6	0.0	252.7	0.0	246.8	21.8	81.9	133.9
04/08/99	249.5	74.6	260.9	0.0	253.4	2.0	243.9	12.7	82.5	139.5
04/09/99	208.0	30.2	219.7	0.0	222.1	0.0	234.3	0.0	84.7	140.4
04/10/99	188.5	9.6	187.7	0.0	191.6	0.0	229.8	0.0	84.6	136.0
04/11/99	184.3	27.9	202.3	0.0	197.5	0.0	204.3	0.0	81.4	113.7
04/12/99	194.0	51.4	197.1	19.3	200.3	0.0	199.5	0.0	83.7	107.0
04/13/99	208.4	53.5	215.2	40.3	217.1	18.0	203.9	0.2	79.9	114.7
04/14/99	240.9	83.0	240.7	68.1	240.1	38.0	255.9	41.2	74.3	131.2
04/15/99	211.2	51.1	223.4	61.3	220.5	36.0	235.6	49.9	68.4	108.1

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

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

Date	<u>Can. Boundary</u>			<u>Grand Coulee</u>				<u>Tlwtr G. Coulee</u>				<u>Chief Joseph</u>				<u>Wells</u>			<u>Rocky Reach</u>					
	<u>24 h</u>		<u>12 h</u>	<u>24 h</u>		<u>12 h</u>	<u>24 h</u>		<u>12 h</u>	<u>24 h</u>		<u>12 h</u>	<u>24 h</u>		<u>12 h</u>	<u>24 h</u>		<u>12 h</u>	<u>24 h</u>		<u>12 h</u>	#		
	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High			
4/2	122	123	123	23	105	106	106	23	103	103	104	23	---	---	---	0	104	104	104	15	102	104	109	24
4/3	116	121	122	24	105	106	109	24	103	104	104	23	---	---	---	0	104	104	105	16	108	109	113	23
4/4	111	111	112	23	105	105	106	23	103	103	104	23	---	---	---	0	104	104	104	20	111	112	113	20
4/5	108	111	112	24	105	105	106	24	103	103	103	24	---	---	---	0	104	104	104	23	107	112	114	24
4/6	106	108	111	24	105	106	107	24	102	103	103	24	---	---	---	0	104	105	108	23	103	104	104	23
4/7	106	107	111	24	105	106	106	24	103	104	104	24	---	---	---	0	103	103	104	11	102	104	105	23
4/8	105	106	110	24	106	106	106	24	103	104	104	24	---	---	---	0	104	104	104	6	104	104	105	22
4/9	103	103	105	24	105	105	105	24	103	103	104	24	---	---	---	0	103	103	103	16	104	105	105	23
4/10	102	103	103	24	105	105	105	24	102	103	103	24	---	---	---	0	---	---	---	0	104	104	105	23
4/11	102	103	104	24	105	106	107	24	103	103	104	24	---	---	---	0	---	---	---	0	105	105	105	23
4/12	103	104	109	24	105	106	106	24	103	103	104	24	---	---	---	0	104	104	104	13	103	105	106	23
4/13	103	104	108	24	103	104	104	24	102	102	102	24	---	---	---	0	103	103	103	17	101	101	101	21
4/14	102	103	103	24	103	103	103	24	101	101	102	24	---	---	---	0	---	---	---	0	101	102	102	23
4/15	104	105	105	24	104	105	105	24	102	102	103	24	---	---	---	0	105	105	106	11	103	103	104	23

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

Date	<u>Tlwtr. Rocky R.</u>				<u>Rock Island</u>				<u>Tlwtr. Rock Island</u>				<u>Wanapum</u>				<u>Tlwtr Wanapum</u>				<u>Priest Rapids</u>			
	<u>24 h</u>		<u>12 h</u>	#	<u>24 h</u>		<u>12 h</u>	#	<u>24 h</u>		<u>12 h</u>	#	<u>24 h</u>		<u>12 h</u>	#	<u>24 h</u>		<u>12 h</u>	#	<u>24 h</u>		<u>12 h</u>	#
	Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High	
4/2	103	104	104	24	103	103	103	24	104	104	105	22	---	---	---	0	---	---	---	0	---	---	---	0
4/3	104	104	104	22	103	104	104	24	104	104	105	24	---	---	---	0	---	---	---	0	---	---	---	0
4/4	---	---	---	0	103	103	103	19	104	104	104	19	---	---	---	0	---	---	---	0	---	---	---	0
4/5	---	---	---	0	103	103	104	24	104	104	104	24	---	---	---	0	---	---	---	0	---	---	---	0
4/6	---	---	---	0	102	103	103	23	103	104	104	21	---	---	---	0	---	---	---	0	---	---	---	0
4/7	---	---	---	0	103	104	104	23	104	104	105	21	---	---	---	0	---	---	---	0	---	---	---	0
4/8	---	---	---	0	103	103	104	22	104	104	105	22	---	---	---	0	---	---	---	0	---	---	---	0
4/9	---	---	---	0	102	103	103	23	103	104	104	21	---	---	---	0	---	---	---	0	---	---	---	0
4/10	---	---	---	0	102	102	102	23	103	103	103	21	---	---	---	0	---	---	---	0	---	---	---	0
4/11	---	---	---	0	103	103	104	22	104	104	105	21	---	---	---	0	---	---	---	0	---	---	---	0
4/12	---	---	---	0	103	104	104	21	105	105	105	20	---	---	---	0	---	---	---	0	---	---	---	0
4/13	---	---	---	0	103	103	104	21	104	104	105	20	---	---	---	0	---	---	---	0	---	---	---	0
4/14	---	---	---	0	102	102	103	23	104	104	105	22	---	---	---	0	---	---	---	0	---	---	---	0
4/15	106	106	106	16	103	104	104	23	105	106	107	22	---	---	---	0	---	---	---	0	---	---	---	0

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

Date	<u>Dwnstr P Rapids</u>				<u>Dworshak</u>				<u>Clearwater</u>				<u>Snake-Lewiston</u>				<u>Lower Granite</u>				<u>Tlwtr L. Granite</u>			
	<u>24 h</u>		<u>12 h</u>	#	<u>24 h</u>		<u>12 h</u>	#	<u>24 h</u>		<u>12 h</u>	#	<u>24 h</u>		<u>12 h</u>	#	<u>24 h</u>		<u>12 h</u>	#	<u>24 h</u>		<u>12 h</u>	#
	Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High		Avg	Avg	High	
4/2	---	---	---	0	107	108	108	23	---	---	---	0	105	106	108	24	106	107	109	24	109	113	119	24
4/3	---	---	---	0	103	105	107	21	---	---	---	0	104	105	106	21	106	106	106	24	112	118	119	24
4/4	---	---	---	0	99	99	99	10	100	100	100	17	101	101	102	17	106	106	106	24	111	115	117	24
4/5	---	---	---	0	100	100	101	22	---	---	---	0	101	102	104	22	106	107	107	23	111	115	117	23
4/6	---	---	---	0	99	99	100	20	100	101	101	24	101	102	103	24	104	104	105	24	111	115	117	24
4/7	---	---	---	0	99	99	100	10	101	102	103	24	102	104	106	24	106	107	108	22	111	116	117	23
4/8	---	---	---	0	100	100	100	5	100	101	101	24	101	102	103	24	105	106	106	24	112	117	118	24
4/9	---	---	---	0	98	98	99	19	100	100	101	24	101	102	103	24	104	104	105	24	111	116	117	24
4/10	---	---	---	0	98	98	99	10	99	99	99	9	102	103	105	24	104	104	105	24	111	117	118	24
4/11	---	---	---	0	---	---	---	0	---	---	---	0	102	104	106	24	104	105	106	24	111	117	118	24
4/12	---	---	---	0	103	106	110	24	102	103	105	24	101	103	103	24	104	104	105	24	112	118	119	24
4/13	---	---	---	0	100	100	101	24	101	101	102	24	102	103	105	24	104	104	104	24	112	118	120	24
4/14	---	---	---	0	98	99	99	24	100	101	102	24	101	103	105	24	104	104	105	24	112	118	119	24
4/15	---	---	---	0	99	100	100	24	101	102	102	24	102	104	105	24	105	107	108	24	112	117	119	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 Sites

Date	<u>Little Goose</u>			<u>Tlwtr L. Goose</u>			<u>Lower Mon.</u>			<u>Tlwtr L. Mon</u>			<u>Ice Harbor</u>			<u>Tlwtr Ice Harbor</u>								
	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>						
	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg					
4/2	106	106	107	24	109	112	119	24	109	109	110	23	111	112	116	22	114	115	116	24	111	112	112	24
4/3	105	106	106	24	112	119	120	24	106	106	107	24	112	115	117	21	112	113	114	24	111	111	112	24
4/4	105	105	105	23	111	117	119	23	111	114	115	23	113	114	117	19	110	110	111	23	111	112	113	23
4/5	108	110	111	23	115	119	120	23	111	113	116	23	112	114	116	18	109	110	112	22	112	113	114	22
4/6	110	112	113	24	115	120	120	23	110	112	114	24	113	114	116	24	111	112	113	24	111	112	114	24
4/7	112	114	117	24	116	120	120	24	114	115	117	24	114	116	117	24	113	114	114	24	110	111	112	24
4/8	112	113	114	24	115	120	120	24	115	117	118	24	116	116	117	24	113	113	114	24	111	112	115	24
4/9	110	111	113	24	115	120	120	24	117	117	117	3	116	116	116	3	112	112	113	24	112	113	115	24
4/10	109	110	111	24	115	120	120	24	---	---	---	0	---	---	---	0	112	113	113	24	112	113	115	24
4/11	109	109	111	24	115	120	120	24	114	115	117	24	115	116	116	24	113	115	116	24	111	112	113	24
4/12	109	112	113	24	115	120	120	24	115	117	119	24	116	117	117	24	113	114	115	24	112	113	113	24
4/13	109	110	112	24	114	119	120	24	113	115	117	24	115	116	118	24	113	113	114	10	111	113	114	24
4/14	109	110	112	24	114	119	119	24	113	115	118	24	114	116	118	24	112	113	115	24	112	114	114	24
4/15	111	112	113	24	115	119	120	24	114	116	119	23	115	117	118	23	115	116	117	24	112	113	115	24

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

Date	<u>McNary-Oregon</u>			<u>McNary-Wash.</u>			<u>Tlwtr McNary</u>			<u>John Day</u>			<u>Tlwtr John Day</u>			<u>The Dalles</u>								
	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>						
	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg					
4/2	---	---	---	0	104	105	107	21	115	115	116	24	108	108	109	22	109	110	115	24	106	107	107	24
4/3	---	---	---	0	104	105	105	16	114	114	114	24	107	108	108	23	107	107	108	23	105	106	107	23
4/4	---	---	---	0	104	105	105	18	113	113	113	24	106	107	107	23	106	106	107	23	105	105	105	23
4/5	---	---	---	0	105	105	105	23	112	112	113	22	106	106	107	24	106	106	106	24	105	105	106	24
4/6	---	---	---	0	105	105	106	24	114	114	115	24	105	105	106	22	105	105	105	24	104	104	105	23
4/7	---	---	---	0	107	108	110	24	114	115	116	24	106	106	106	21	105	105	106	24	105	105	105	23
4/8	---	---	---	0	106	106	107	24	115	116	116	24	105	105	106	23	105	105	105	24	104	104	105	23
4/9	106	106	106	12	104	104	105	24	109	111	112	24	104	104	104	23	103	104	104	24	103	103	103	23
4/10	106	106	106	10	105	105	106	24	107	108	109	24	105	106	107	23	104	105	105	24	103	103	103	23
4/11	106	107	108	24	105	106	107	24	109	109	111	24	106	107	108	23	105	105	105	24	104	104	105	23
4/12	105	105	106	24	106	106	107	24	111	112	112	24	105	106	108	23	108	112	119	24	104	104	105	23
4/13	106	107	108	24	105	106	106	24	111	112	113	24	104	104	104	22	111	118	120	23	105	106	108	23
4/14	106	107	108	24	105	106	107	24	114	115	116	24	103	103	104	23	119	119	120	5	106	108	110	23
4/15	106	108	109	24	107	108	109	24	111	112	112	24	104	104	105	23	114	117	120	15	109	110	110	23

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

Date	<u>Dnstr T. Dalles</u>			<u>Bonneville</u>			<u>Warrendale</u>			<u>Skamania</u>			<u>CamasWash.</u>			<u>Wauna Mill</u>								
	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>						
	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg	Avg	High	Avg					
4/2	108	109	109	24	106	106	107	24	111	111	111	24	108	109	109	24	109	109	110	24	---	---	---	0
4/3	107	108	109	23	105	105	106	23	108	109	110	23	106	107	108	23	106	107	108	23	---	---	---	0
4/4	106	106	107	24	104	105	105	23	110	110	110	23	107	107	108	23	107	107	108	23	---	---	---	0
4/5	107	108	108	24	104	105	105	24	110	110	111	24	107	107	108	24	107	107	108	24	---	---	---	0
4/6	106	106	107	24	105	105	105	23	110	110	110	23	107	108	108	23	107	108	109	24	---	---	---	0
4/7	106	106	107	24	105	105	106	23	107	108	110	23	106	107	108	23	106	107	108	24	---	---	---	0
4/8	104	105	106	24	104	104	105	23	106	108	110	23	105	106	108	23	106	107	107	24	---	---	---	0
4/9	102	103	103	24	102	103	103	23	103	103	104	23	103	103	103	23	103	103	104	24	---	---	---	0
4/10	103	103	104	24	103	103	104	23	103	103	104	23	103	103	103	23	102	103	103	24	---	---	---	0
4/11	104	104	105	24	103	103	104	23	103	103	104	23	103	104	104	23	109	113	135	20	---	---	---	0
4/12	104	104	105	24	104	104	104	23	103	103	104	23	103	104	104	19	105	106	122	18	---	---	---	0
4/13	105	107	112	24	103	103	103	23	103	103	103	23	103	104	104	23	103	104	105	24	---	---	---	0
4/14	109	111	114	24	103	103	104	23	107	108	109	23	105	106	107	23	103	104	106	22	---	---	---	0
4/15	112	113	114	24	108	109	109	23	111	113	113	23	110	111	112	23	106	107	108	24	---	---	---	0

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

Site	Date	Species	Number of Fish	Number w GBT signs	Number w Fin Signs	% Fin GBT	% Severe Fin GBT	Number of Fish with Fin GBT Listed by Highest Rank				Fish with L. Line GBT	
								Rank 1	Rank 2	Rank 3	Rank 4	Num Fish	Avg. Rank
<b>Lower Granite Dam</b>													
	04/12/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/12/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0
<b>Little Goose Dam</b>													
	04/14/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/14/99	Steelhead	100	0	0	0.00%	0.00%	0	0	0	0	0	0
<b>Lower Monumental Dam</b>													
	04/12/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/12/99	Steelhead	100	2	1	1.00%	0.00%	1	0	0	0	1	1
<b>Ice Harbor Dam</b>													
	04/13/99	Yearling Chinook	57	1	0	0.00%	0.00%	0	0	0	0	1	1
	04/13/99	Steelhead	11	0	0	0.00%	0.00%	0	0	0	0	0	0
<b>McNary Dam</b>													
	04/12/99	Yearling Chinook	100	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/12/99	Steelhead	8	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/15/99	Yearling Chinook	100	1	0	0.00%	0.00%	0	0	0	0	1	1
	04/15/99	Steelhead	13	0	0	0.00%	0.00%	0	0	0	0	0	0
<b>Bonneville Dam</b>													
	04/12/99	Yearling Chinook	73	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/12/99	Steelhead	95	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/15/99	Yearling Chinook	84	3	3	3.57%	0.00%	1	2	0	0	0	0
	04/15/99	Steelhead	59	1	1	1.69%	1.69%	0	0	1	0	0	0
<b>Rock Island Dam</b>													
	04/12/99	Yearling Chinook	53	2	0	0.00%	0.00%	0	0	0	0	2	1
	04/12/99	Steelhead	4	0	0	0.00%	0.00%	0	0	0	0	0	0
	04/15/99	Yearling Chinook	24	2	0	0.00%	0.00%	0	0	0	0	2	1
	04/15/99	Steelhead	8	0	0	0.00%	0.00%	0	0	0	0	0	0



## Hatchery Release Summary For the Last Two Weeks From 3/26/99 to 4/8/99

Hatchery	Species	Migration	Year	Number ...Release Dates...		Site	River Name
				Released	Begin.....EndRelease		
<b>Colville Tribe</b>							
Cassimer Bar	Sockeye		1999	13,396	4/7/99	4/7/99 Okanogan R	Okanogan River
	<b>Agency Total</b>			13,396			
<b>IDFG</b>							
Clearwater	SP Chinook		1999	665,000	4/15/99	4/15/99 Crooked R Acclim Pd	S Fk Clearwater River
	SP Chinook		1999	300,000	4/15/99	4/15/99 Red River Acclim Pd	S Fk Clearwater River
Magic Valley	SU Steelhead		1999	30,000	4/10/99	4/30/99 Sawtooth H	Salmon River
	SU Steelhead		1999	360,200	4/10/99	4/20/99 Little Salmon R	Salmon River
	SU Steelhead		1999	343,640	4/15/99	4/20/99 Lemhi R	Salmon River
McCall	SU Chinook		1999	1,017,650	4/5/99	4/8/99 S Fk Salmon R	Salmon River
	SU Chinook		1999	122,900	4/5/99	4/8/99 S Fk Salmon R	Salmon River
Niagara Springs	SU Steelhead		1999	657,665	3/22/99	4/4/99 Hells Canyon Dam	Snake River
	SU Steelhead		1999	30,369	4/5/99	4/5/99 Pine Bar/Salmon R	Salmon River
	SU Steelhead		1999	150,000	4/7/99	4/9/99 Hammer Cr	Salmon River
	SU Steelhead		1999	830,000	4/11/99	4/29/99 Pahsimeroi H	Pahsimeroi River
Pahsimeroi	SU Chinook		1999	135,650	4/12/99	4/12/99 Pahsimeroi H	Pahsimeroi River
Powell	SP Chinook		1999	334,800	4/14/99	4/14/99 Powell Acclim Pd	Lochsa River
Rapid River	SP Chinook		1999	2,847,500	3/16/99	4/15/99 Rapid River H	Little Salmon River
	<b>Agency Total</b>			7,825,374			
<b>Nez Perce Tribe</b>							
Clearwater	SP Chinook		1999	147,975	3/31/99	4/2/99 Lolo Cr	Clearwater Rvr M F
Lookingglass	SP Chinook		1999	12,061	4/1/99	4/15/99 Lostine R	Grande Ronde River
Lyons Ferry	FA Chinook		1999	150,000	3/25/99	4/12/99 Cpt John Acclim Pd	Snake River
	FA Chinook		1999	228,000	4/12/99	4/15/99 Clearwater R	Clearwater Rvr M F
	FA Chinook		1999	150,000	4/12/99	4/15/99 Pittsburg Landing	Snake River
McCall	SU Chinook		1999	39,000	4/5/99	4/8/99 S Fk Salmon R	Salmon River
Powell	SP Chinook		1999	95,615	4/5/99	4/7/99 Lochsa R	Clearwater Rvr M F
	SP Chinook		1999	47,950	4/7/99	4/7/99 Papoose Cr	Clearwater Rvr M F
	SP Chinook		1999	19,600	4/8/99	4/8/99 Lochsa R	Clearwater Rvr M F
	<b>Agency Total</b>			890,201			

Hatchery Release Summary  
For the Last Two Weeks  
From 3/26/99 to 4/8/99

Hatchery	Species	Migration	Year	Number ...Release Dates...		Release Site	River Name
				Released	Begin.....End		
<b>ODFW</b>							
Big Canyon	SU	Steelhead	1999	120,000	4/6/99	4/6/99 Big Canyon H	Grande Ronde River
	SU	Steelhead	1999	120,000	4/8/99	4/21/99 Big Canyon H	Grande Ronde River
Cascade		Coho	1999	250,000	3/30/99	4/8/99 Umatilla R	Umatilla River
		Coho	1999	750,000	4/10/99	4/20/99 Umatilla R	Umatilla River
Imnaha	SP	Chinook	1999	96,300	3/16/99	4/15/99 Imnaha Acclim Pd	Imnaha River
	SP	Chinook	1999	89,000	3/16/99	4/15/99 Imnaha Acclim Pd	Imnaha River
Irrigon	SU	Steelhead	1999	137,500	4/1/99	4/15/99 Wallowa Acclim Pd	Grande Ronde River
	SU	Steelhead	1999	125,000	4/5/99	4/9/99 Grande Ronde R	Grande Ronde River
Li Sheep	SU	Steelhead	1999	210,000	4/13/99	4/13/99 L Sheep Acclim Pd	Imnaha River
Lookingglass	SP	Chinook	1999	10,300	4/5/99	4/6/99 Imnaha R	Imnaha River
Oak Springs	SU	Steelhead	1999	61,000	4/7/99	4/9/99 Hood R	Hood River
Round Butte	SU	Steelhead	1999	162,000	4/5/99	4/19/99 Bel. Pelton Dam	Deschutes River
	SP	Chinook	1999	310,000	4/12/99	4/15/99 Bel. Pelton Dam	Deschutes River
Wallowa	SU	Steelhead	1999	217,000	4/1/99	4/19/99 Wallowa Acclim Pd	Grande Ronde River
				<b>Agency Total</b>	2,658,100		
<b>Umatilla Tribe</b>							
Bonifer	SU	Steelhead	1999	50,000	4/10/99	4/20/99 Bonifer Acclim Pd	Umatilla River
Imeques	SP	Chinook	1999	275,000	4/10/99	4/20/99 Imeques Acclim Pd	Umatilla River
Minthorn	SU	Steelhead	1999	50,000	4/10/99	4/20/99 Minthorn Acclim Pd	Umatilla River
Thornhollow	FA	Chinook	1999	240,000	4/10/99	4/20/99 Thornhollow Acclim Pd	Umatilla River

## Hatchery Release Summary For the Last Two Weeks From 4/2/99 to 4/15/99

Hatchery	Species...	Migration	Year	Number ...Release Dates...		Release Site	River Name
				Released	Begin.....End		
<b>USFWS</b>							
Dworshak	SP	Chinook	1999	1,050,000	4/7/99	4/8/99 Dworshak H	Clearwater Rvr M F
Entiat	SP	Chinook	1999	354,000	4/7/99	4/7/99 Entiat H	Entiat River
Hagerman	SU	Steelhead	1999	410,000	4/14/99	5/10/99 Little Salmon R	Salmon River
Kooskia	SP	Chinook	1999	630,000	4/6/99	4/6/99 Kooskia H	Clearwater Rvr M F
	SP	Chinook	1999	50,000	4/6/99	4/6/99 Clear Cr	Clearwater Rvr M F
Winthrop	SU	Steelhead	1999	113,000	4/14/99	5/15/99 Winthrop H	Methow River
	SP	Chinook	1999	545,000	4/15/99	4/15/99 Winthrop H	Methow River
				<b>Agency Total</b>	3,152,000		
<b>WDFW</b>							
Chewuch	SP	Chinook	1999	132,900	4/15/99	5/1/99 Chewuch R	Methow River
Chiwawa	SP	Chinook	1999	266,500	4/15/99	4/30/99 Chiwawa H	Wenatchee River
East Bank	SU	Chinook	1999	442,000	4/15/99	4/30/99 Dryden Acclim Pd	Wenatchee River
Klickitat		Coho	1999	1,150,000	4/15/99	6/10/99 Klickitat H	Klickitat River
Lyons Ferry	SU	Steelhead	1999	250,000	3/25/99	4/30/99 Cottonwood Acclim Pd	Grande Ronde River
	SU	Steelhead	1999	125,000	3/25/99	4/30/99 Dayton Acclim Pd	Walla Walla River
	FA	Chinook	1999	450,000	3/25/99	4/12/99 Lyons Ferry H	Snake River
	SU	Steelhead	1999	175,000	4/15/99	4/30/99 Walla Walla R	Walla Walla River
	SU	Steelhead	1999	80,000	4/15/99	4/15/99 Lyons Ferry H	Snake River
Methow	SP	Chinook	1999	334,000	4/15/99	4/25/99 Methow H	Methow River
	SP	Chinook	1999	26,850	4/15/99	4/25/99 Twisp R	Methow River
Ringold	SP	Chinook	1999	876,000	4/1/99	4/4/99 Ringold Springs H	Mid-Columbia River
Skamania	SU	Steelhead	1999	120,000	4/15/99	4/30/99 Klickitat R	Klickitat River
	WI	Steelhead	1999	10,000	4/15/99	4/30/99 Rock Cr	Columbia River
	SU	Steelhead	1999	50,000	4/15/99	4/30/99 Little White Salmon R	Little White Salmon Riv
	WI	Steelhead	1999	40,000	4/15/99	4/30/99 Northwestern Lake	White Salmon River

## Hatchery Release Summary

### For the Last Two Weeks

From 4/2/99 to 4/15/99

Hatchery	Species	Migration	Year	Number ...Release Dates...		Release Site	River Name
				Released	Begin.....End		
Tucannon	SP	Chinook	1999	25,000	3/9/99	4/20/99 Curl Lake	Tucannon River
Washougal		Coho	1999	2,527,000	3/29/99	4/5/99 Klickitat R	Klickitat River
Wells	SU	Chinook	1999	589,900	4/5/99	4/26/99 Similkameen Acclim Pd	Okanogan River
	SU	Chinook	1999	410,000	4/12/99	4/19/99 Wells H	Mid-Columbia River
	SU	Steelhead	1999	250,000	4/15/99	5/5/99 Methow R	Methow River
	SU	Steelhead	1999	236,000	4/15/99	5/5/99 Wells H	Mid-Columbia River
	SU	Steelhead	1999	50,000	4/15/99	4/30/99 Okanogan R	Okanogan River
				<b>Agency Total</b>	8,616,150		
<b>Warm Springs Tribe</b>							
Oak Springs	SU	Steelhead	1999	20,000	4/6/99	4/6/99 W Fk Hood R	Hood River
	WI	Steelhead	1999	52,000	4/14/99	5/4/99 E Fk Hood R	Hood River
Round Butte	SP	Chinook	1999	30,000	4/5/99	4/15/99 Hood R	Hood River
	SP	Chinook	1999	40,000	4/8/99	4/21/99 W Fk Hood R	Hood River
	SP	Chinook	1999	55,000	4/8/99	4/21/99 W Fk Hood R	Hood River
				<b>Agency Total</b>	197,000		
<b>Yakima Tribe</b>							
Leavenworth		Coho	1999	67,500	4/10/99	4/10/99 Nason Cr	Wenatchee River
				<b>Agency Total</b>	67,500		
				<b>Total Release</b>	24,034,721		

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

Hatchery	Species	Migration	Year	Number	...Release Dates...		Release Site	River Name
				Released	Begin.....	End		
<b>IDFG</b>								
Clearwater	SU	Steelhead	1999	5,000	4/20/99	4/20/99	S FK Red R	Clearwater Rvr M F
	SU	Steelhead	1999	422,000	4/28/99	4/30/99	S Fk Clearwater R	Clearwater Rvr M F
	SU	Steelhead	1999	170,000	4/28/99	4/28/99	Clear Cr	Clearwater Rvr M F
Magic Valley	SU	Steelhead	1999	293,930	4/20/99	4/23/99	McNabb/Salmon R	Salmon River
	SU	Steelhead	1999	119,970	4/21/99	4/23/99	Shoup Br (Salmon R)	Salmon River
	SU	Steelhead	1999	96,000	4/26/99	4/27/99	Salmon R	Salmon River
	SU	Steelhead	1999	101,200	4/27/99	5/15/99	Squaw Cr Acclim Pd	Salmon River
	SU	Steelhead	1999	312,000	4/27/99	5/5/99	Squaw Cr Acclim Pd	Salmon River
	SU	Steelhead	1999	301,000	4/27/99	5/3/99	E Fk Salmon R	Salmon River
Sawtooth	SP	Chinook	1999	118,000	4/16/99	4/16/99	Sawtooth H	Salmon River
	SP	Chinook	1999	107,000	4/16/99	4/16/99	Sawtooth H	Salmon River
	SU	Steelhead	1999	480,000	4/23/99	4/23/99	Sawtooth H	Salmon River
				<b>Agency Total</b>	2,526,100			
<b>Nez Perce Tribe</b>								
Clearwater	SP	Chinook	1999	39,640	4/19/99	4/19/99	S Fk Clearwater R	Clearwater Rvr M F
Dworshak		Coho	1999	220,000	4/26/99	4/30/99	Clear Cr	Clearwater Rvr M F
				<b>Agency Total</b>	259,640			
<b>Umatilla Tribe</b>								
Bonifer	SU	Steelhead	1999	50,000	4/20/99	4/30/99	Bonifer Acclim Pd	Umatilla River
				<b>Agency Total</b>	50,000			
<b>USFWS</b>								
Carson	SP	Chinook	1999	1,421,000	4/20/99	4/20/99	Carson H	Wind River
Dworshak	SU	Steelhead	1999	200,000	4/19/99	4/23/99	Clear Cr	Clearwater Rvr M F
	SU	Steelhead	1999	600,000	4/19/99	4/23/99	S Fk Clearwater R	Clearwater Rvr M F
	SU	Steelhead	1999	1,300,000	4/26/99	4/30/99	Dworshak H	Clearwater Rvr M F
Hagerman	SU	Steelhead	1999	230,000	4/19/99	4/23/99	Sawtooth H	Salmon River
Leavenworth	SP	Chinook	1999	1,650,000	4/19/99	4/19/99	Leavenworth H	Wenatchee River

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

Hatchery	Species	Migration	Year	Number ...Release Dates...		Release Site	River Name
				Released	Begin.....End		
L White Salmon	SP	Chinook	1999	1,077,000	4/20/99	4/20/99 Little White Salmon H	Little White Salmon Riv
Spring Creek	FA	Chinook	1999	3,600,000	4/22/99	4/22/99 Spring Creek H	Columbia River
Willard		Coho	1999	2,126,000	4/19/99	4/19/99 Little White Salmon R	Little White Salmon Riv
				<b>Agency Total</b>	12,204,000		
<b>WDFW</b>							
Chiwawa	SU	Steelhead	1999	187,400	4/22/99	5/7/99 Chiwawa H	Wenatchee River
Lyons Ferry	SU	Steelhead	1999	160,000	4/20/99	4/20/99 Tucannon R	Tucannon River
Turtle Rock	SU	Steelhead	1999	40,000	4/20/99	4/30/99 Entiat R	Entiat River
	SU	Steelhead	1999	145,000	4/20/99	4/30/99 Wenatchee R	Wenatchee River
	SU	Chinook	1999	203,000	4/20/99	4/30/99 Turtle Rock H	Mid-Columbia River
	SU	Steelhead	1999	3,000	4/25/99	4/30/99 Turtle Rock H	Mid-Columbia River
Wells	SU	Steelhead	1999	118,500	4/20/99	4/30/99 Chewuch R	Methow River
	SU	Steelhead	1999	100,000	4/20/99	5/20/99 Winthrop H	Methow River
	SU	Steelhead	1999	78,000	4/27/99	5/15/99 Similkameen Acclim Pd	Okanogan River
				<b>Agency Total</b>	1,034,900		
<b>Yakima Tribe</b>							
Prosser	FA	Chinook	1999	1,690,000	4/25/99	5/25/99 Prosser Acclim Pd	Yakama River
				<b>Agency Total</b>	1,690,000		
				<b>Total Release</b>	17,764,640		

## Two-Week Summary of Passage Indices

### Yearling Chinook

Date	Hatchery							Hatchery/Wild Combined			
	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/02/99	365	89	352	38	867	91	960	1	4,303	6,424	570
04/03/99	---	81	---	---	1,231	240	1,420	8	4,688	---	513
04/04/99	---	333	---	---	860	137	671	1	12,401	---	750
04/05/99	8	173	93	159	480	133	686	1	21,251	---	807
04/06/99	56	91	47	75	184	190	1,584	0	51,167	---	777
04/07/99	235	1,823	17	78	656	248	2,138	85	55,483	1,500	824
04/08/99	353	250	10	81	639	480	3,157	79	30,217	4,120	842
04/09/99	527	236	17	57	803	675	3,246	95	21,470	5,649	638
04/10/99	---	509	---	---	1,013	919	2,637	117	13,319	4,267	636
04/11/99	---	714	---	---	357	685	6,999	103	13,958	4,600	709
04/12/99	137	166	16	127	1,081	873	4,589	66	14,418	4,770	665
04/13/99	427	1,001	16	86	1,418	1,023	3,510	79	19,354	5,339	907
04/14/99	352	315	19	128	2,853	1,351	5,893	108	16,314	8,885	1,235
04/15/99	598	555	28	147	3,792	2,084	14,513	34	20,803	14,820	1,178
<b>Total:</b>	<b>3,058</b>	<b>6,336</b>	<b>615</b>	<b>976</b>	<b>16,234</b>	<b>9,129</b>	<b>52,003</b>	<b>777</b>	<b>299,146</b>	<b>60,374</b>	<b>11,051</b>
<b># Days:</b>	<b>10</b>	<b>14</b>	<b>10</b>	<b>10</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>10</b>	<b>14</b>
<b>Average:</b>	<b>306</b>	<b>453</b>	<b>62</b>	<b>98</b>	<b>1,160</b>	<b>652</b>	<b>3,715</b>	<b>56</b>	<b>21,368</b>	<b>6,037</b>	<b>789</b>

### Wild Yearling Chinook

Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)
04/02/99	125	215	36	71	2,400	64	110
04/03/99	---	106	---	---	3,789	121	133
04/04/99	---	101	---	---	1,816	118	101
04/05/99	0	73	13	261	2,194	90	83
04/06/99	23	142	20	87	1,710	227	161
04/07/99	76	152	10	91	2,722	250	123
04/08/99	59	29	13	36	2,558	663	178
04/09/99	61	69	21	48	2,676	542	160
04/10/99	---	215	---	---	2,638	2,648	579
04/11/99	---	162	---	---	2,290	4,559	929
04/12/99	104	87	18	72	3,022	4,774	1,324
04/13/99	172	57	16	51	2,615	6,736	2,643
04/14/99	130	97	47	57	3,825	7,007	4,032
04/15/99	158	191	51	25	5,402	10,047	2,986
<b>Total:</b>	<b>908</b>	<b>1,696</b>	<b>245</b>	<b>799</b>	<b>39,657</b>	<b>37,846</b>	<b>13,542</b>
<b># Days:</b>	<b>10</b>	<b>14</b>	<b>10</b>	<b>10</b>	<b>14</b>	<b>14</b>	<b>14</b>
<b>Average:</b>	<b>91</b>	<b>121</b>	<b>25</b>	<b>80</b>	<b>2,833</b>	<b>2,703</b>	<b>967</b>

### Wild Subyearling Chinook

LGR (INDEX)	LGS (INDEX)	LMN (INDEX)
0	0	0
0	0	7
0	0	0
50	0	0
0	0	1
0	0	0
36	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
86	0	8
14	14	14
6	0	1

**NOTE: John Day Dam April 2nd: Consider these data with caution, sample timer malfunctions caused unreliable passage indices for this day.**

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

Smolt indices, wild & hatchery or combined, are presented in the following order: yearling chinook (chinook 1's), subyearling chinook (chinook 0's), steelhead, coho, and sockeye. Two classes of fish counts are shown in these tables: collection counts, which account for sample rates but are not adjusted for flow; and passage indices, which are collection counts divided by the proportion of water passing through the sampling system. Collection counts may be constrained due to sampling effort or river flow. Passage indices are not population estimates, but are used to adjust collection counts for daily fluctuations in the site's or project's operations. The classes of counts presented in the report are defined below for each site. Most samples occur over a 24 hour period that spans two calendar days. In this report, the date shown corresponds with the sample end date.

## Two-Week Summary of Passage Indices

Date	Hatchery Subyearling Chinook							Combined Subyearling Chinook			
	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/02/99	0	0	0	0	0	0	0	15	1,831	51	130
04/03/99	---	0	---	---	0	0	0	6	1,115	---	39
04/04/99	---	0	---	---	0	0	0	14	456	---	141
04/05/99	0	0	0	0	0	0	0	9	146	---	58
04/06/99	0	0	0	0	0	0	0	9	326	---	79
04/07/99	0	0	0	0	0	0	0	26	2,510	0	93
04/08/99	0	0	0	0	0	0	0	25	998	0	80
04/09/99	0	0	0	0	0	0	0	100	1,065	0	21
04/10/99	---	0	---	---	0	0	0	42	1,582	51	21
04/11/99	---	0	---	---	0	0	0	43	1,021	80	10
04/12/99	0	0	0	0	0	0	0	37	1,429	11	27
04/13/99	0	0	0	0	0	0	0	29	2,351	30	10
04/14/99	0	0	0	0	0	0	0	103	2,254	28	27
04/15/99	0	0	0	0	0	0	0	115	2,289	86	53
<b>Total:</b>	0	0	0	0	0	0	0	573	19,373	337	789
<b># Days:</b>	10	14	10	10	14	14	14	14	14	10	14
<b>Average:</b>	0	0	0	0	0	0	0	41	1,384	34	56

Date	All Coho										
	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/02/99	0	0	0	0	17	0	0	0	0	103	324
04/03/99	---	0	---	---	0	0	0	5	0	---	250
04/04/99	---	0	---	---	0	0	0	0	0	---	368
04/05/99	0	0	0	1	0	8	0	1	0	---	346
04/06/99	0	0	0	4	0	0	0	0	41	---	369
04/07/99	0	0	0	0	0	0	0	1	0	80	371
04/08/99	0	0	0	0	0	0	0	0	71	50	671
04/09/99	0	0	0	0	18	0	0	1	0	52	617
04/10/99	---	0	---	---	17	8	0	1	34	92	1,658
04/11/99	---	0	---	---	0	0	0	2	22	250	1,122
04/12/99	0	0	0	0	0	0	0	0	26	111	902
04/13/99	0	0	0	0	0	0	21	4	0	182	673
04/14/99	0	0	0	0	0	0	0	0	56	304	956
04/15/99	0	0	0	0	0	0	0	0	0	221	1,192
<b>Total:</b>	0	0	0	5	52	16	21	15	250	1,445	9,819
<b># Days:</b>	10	14	10	10	14	14	14	14	14	10	14
<b>Average:</b>	0	0	0	1	4	1	2	1	18	145	701

**NOTE: John Day Dam April 2nd: Consider these data with caution, sample timer malfunctions caused unreliable passage indices for this day.**

### Definitions for Smolt Index Counts

WTB (Collection) = Salmon River Trap at Whitebird : Collection Counts  
 IMN (Collection) = Imnaha River Trap : Collection Counts  
 GRN (Collection) = Grande Ronde River Trap : Collection Counts  
 LEW (Collection) = Snake River Trap at Lewiston : Collection Counts  
 LGR (Index) = Lower Granite Dam Bypass Collection System : Passage Index Counts : Passage Index = (Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill) })  
 LGS (Index) = Little Goose Bypass Collection System : Passage Index Counts : Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill) }  
 LMN (Index) = Lower Monumental Dam Bypass Collection System : Passage Index Counts : Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill) }



## Two-Week Summary of Passage Indices

### Hatchery Steelhead

Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/02/99	0	0	0	5	2,033	66	80	0	7,289	10,330	648
04/03/99	---	0	---	---	3,982	154	44	0	2,973	---	1,039
04/04/99	---	0	---	---	2,031	68	65	0	3,435	---	1,174
04/05/99	0	0	27	34	1,312	125	15	0	3,318	---	1,685
04/06/99	0	0	39	21	2,197	309	95	3	3,273	---	1,277
04/07/99	0	0	12	28	5,253	649	54	0	976	1,500	1,137
04/08/99	0	0	5	29	2,967	765	149	1	713	2,450	1,286
04/09/99	0	0	19	24	4,336	1,351	264	1	541	2,337	691
04/10/99	---	0	---	---	10,480	1,619	434	0	894	2,606	459
04/11/99	---	0	---	---	5,056	2,275	598	1	586	2,060	451
04/12/99	0	1	53	86	7,650	3,365	871	2	663	1,919	756
04/13/99	0	0	33	32	7,332	5,264	1,198	1	436	1,377	936
04/14/99	0	14	16	22	15,888	4,948	1,667	0	817	1,056	584
04/15/99	26	453	20	18	14,024	4,520	1,939	0	792	1,393	636
<b>Total:</b>	26	468	224	299	84,541	25,478	7,473	9	26,706	27,028	12,759
<b># Days:</b>	10	14	10	10	14	14	14	14	14	10	14
<b>Average:</b>	3	33	22	30	6,039	1,820	534	1	1,908	2,703	911

### Wild Steelhead

Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/02/99	0	3	3	1	817	118	280	1	255	2,878	246
04/03/99	---	3	---	---	1,834	160	311	4	116	---	131
04/04/99	---	2	---	---	788	75	152	0	510	---	71
04/05/99	0	1	0	3	480	208	83	3	561	---	130
04/06/99	0	1	2	2	376	265	210	3	858	---	184
04/07/99	0	2	1	1	733	277	100	9	418	140	70
04/08/99	0	1	0	1	320	455	141	5	285	330	137
04/09/99	0	2	1	0	517	581	192	8	200	221	128
04/10/99	---	2	---	---	1,205	941	322	7	378	394	146
04/11/99	---	2	---	---	566	834	202	5	195	390	67
04/12/99	0	4	0	4	524	405	303	2	255	322	109
04/13/99	0	3	2	3	640	798	165	4	764	379	117
04/14/99	0	3	2	3	1,266	597	213	15	366	374	133
04/15/99	2	6	3	0	823	811	236	12	264	77	146
<b>Total:</b>	2	35	14	18	10,889	6,525	2,910	78	5,425	5,505	1,815
<b># Days:</b>	10	14	10	10	14	14	14	14	14	10	14
<b>Average:</b>	0	3	1	2	778	466	208	6	388	551	130

**NOTE: John Day Dam April 2nd: Consider these data with caution, sample timer malfunctions caused unreliable passage indices for this day.**

**Definitions for Smolt Index Counts.**

RIS (Index) = Rock Island Dam Second Powerhouse Bypass Trap : Passage Index Counts : Passage Index = Collection Counts / {Powerhouse 2 Flow / (Powerhouses 1 & 2 Flow + Spill) }

MCN (Index)= McNary Dam Bypass Collection System : Passage Index Counts : Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill) }

JDA (Index) = John Day Dam Bypass Collection System : Passage Index Counts : Passage Index = Collection Counts / {Powerhouse Flow / (Powerhouse Flow + Spill) }

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

## Two-Week Summary of Passage Indi-

Hatchery Sockeye											
Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/02/99	0	0	0	0	0	0	0	0	0	0	0
04/03/99	---	0	---	---	0	0	0	0	0	---	0
04/04/99	---	0	---	---	0	0	0	0	0	---	0
04/05/99	0	0	0	0	0	0	0	0	0	---	14
04/06/99	0	0	0	0	0	0	0	0	0	---	0
04/07/99	0	0	0	0	0	0	0	1	0	0	0
04/08/99	0	0	0	0	0	0	0	1	0	0	0
04/09/99	0	0	0	0	0	0	0	4	0	0	0
04/10/99	---	0	---	---	0	0	0	1	0	0	0
04/11/99	---	0	---	---	0	0	0	1	0	0	0
04/12/99	0	0	0	0	0	0	0	5	0	0	0
04/13/99	0	0	0	0	0	0	0	0	0	5	0
04/14/99	0	0	0	0	0	0	0	5	0	0	0
04/15/99	0	0	0	0	0	0	0	5	0	0	0
<b>Total:</b>	0	0	0	0	0	0	0	23	0	5	14
<b># Days:</b>	10	14	10	10	14	14	14	14	14	10	14
<b>Average:</b>	0	0	0	0	0	0	0	2	0	1	1

Wild Sockeye											
Date	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	RIS (INDEX)	MCN (INDEX)	JDA (INDEX)	BO1 (INDEX)
04/02/99	0	0	0	0	67	35	10	0	29	0	13
04/03/99	---	0	---	---	217	43	15	0	29	---	66
04/04/99	---	0	---	---	47	27	7	0	54	---	14
04/05/99	0	0	0	0	0	21	45	0	24	---	14
04/06/99	0	0	0	0	62	38	32	0	82	---	0
04/07/99	0	0	0	0	12	15	31	1	0	0	35
04/08/99	0	0	0	1	53	17	7	0	0	0	46
04/09/99	0	0	0	0	71	18	0	0	0	0	11
04/10/99	---	0	---	---	17	73	56	2	0	3	10
04/11/99	---	0	---	---	59	62	65	2	43	30	19
04/12/99	0	0	0	0	31	98	60	0	128	33	0
04/13/99	0	0	0	0	0	484	41	4	108	10	10
04/14/99	0	0	0	0	88	67	58	0	28	28	27
04/15/99	0	0	0	0	72	0	157	0	147	124	13
<b>Total:</b>	0	0	0	1	796	998	584	9	672	228	278
<b># Days:</b>	10	14	10	10	14	14	14	14	14	10	14
<b>Average:</b>	0	0	0	0	57	71	42	1	48	23	20

**NOTE: John Day Dam April 2nd: Consider these data with caution, sample timer malfunctions caused unreliable passage indices for this day.**

LEW and WTB data collected for the FPC by Idaho Dept. of Fish and Game.  
 JDA and BO1 data collected for the FPC by National Marine Fisheries Service.  
 RIS data collected for the FPC by Chelan Co. PUD/Washington Dept. of Fish and Wildlife.  
 LGR, LMN, and MCN data collected for the FPC by Washington Dept. of Fish and Wildlife.  
 LGS and GRN data collected for the FPC by Oregon Dept. of Fish and Wildlife. IMN data collected for the FPC by the Nez Perce Tribe.

**Cumulative Adult Passage at Mainstem Dams Through April 15, 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	3,036	14	8,238	11	14,369	62	0	0	0	0	0	0	0	0	0	0	0	0
TDA	368	3	3,402	3	4,170	18	0	0	0	0	0	0	0	0	0	0	0	0
JDA	75	0	1,363	6	1,551	15	0	0	0	0	0	0	0	0	0	0	0	0
MCN	19	0	496	0	762	9	0	0	0	0	0	0	0	0	0	0	0	0
IHR	8	0	161	0	208	1	0	0	0	0	0	0	0	0	0	0	0	0
LMN	0	0	37	0	73	1	0	0	0	0	0	0	0	0	0	0	0	0
LGS	2	0	21	0	X	X	0	0	0	0	X	X	0	0	0	0	X	X
LWG	0	0	16	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0
PRD	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RIS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RRH	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WEL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

DAM	Coho						Sockeye			Steelhead				
	1999		1998		10-Yr Avg.		10-Yr			10-Yr			Wild	Wild
	Adult	Jack	Adult	Jack	Adult	Jack	1999	1998	Avg.	1999	1998	Avg.	1999	1998
BON	0	0	0	0	0	0	0	0	0	780	1,013	1,640	117	209
TDA	0	0	0	0	0	0	0	0	0	125	467	982	42	118
JDA	0	0	0	0	0	0	0	0	0	1,520	2,828	1,738	312	380
MCN	0	0	0	0	0	0	0	0	0	106	982	1,578	25	296
IHR	0	0	0	0	0	0	0	0	0	467	1,359	1,918	153	350
LMN	0	0	0	0	0	0	0	0	0	327	1,183	1,608	51	304
LGS	0	0	0	0	X	X	0	0	X	590	1,535	X	174	401
LWG	0	0	0	0	0	0	0	0	0	2,743	3,847	4,688	377	549
PRD	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RIS	---	---	---	---	---	---	---	---	---	---	---	---	---	---
RRH	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WEL	---	---	---	---	---	---	---	---	---	---	---	---	---	---

\* LGS and LMN are through 04/14/99.

\*RIS, RRH, PRD and WEL are not yet reporting.

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

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

\*Historic counts (pre-1996) were obtained from CRITFC and compiled by the FPC.

\*Historic counts 1997 to present were obtained from the Corps of Engineers.

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

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

**Transportation Summary Report  
Two-Week Transportation Summary  
from 04/02/99 to 04/15/99**

	Yearling Chinook	Subyearling Chinook	Steelhead	Coho	Sockeye	Total
<b>LOWER GRANITE DAM</b>						
Collected	34,186	53	56,309	37	515	91,100
Bypassed	1,293	0	1,690	1	0	2,984
Trucked	16,447	116	14,278	16	505	31,362
Barged	16,722	20	35,291	20	177	52,230
<b>Total Transported</b>	<b>33,169</b>	<b>136</b>	<b>49,569</b>	<b>36</b>	<b>682</b>	<b>83,592</b>
<b>LITTLE GOOSE DAM</b>						
Collected	30,908	0	20,964	11	659	52,542
Bypassed	0	0	0	0	0	0
Trucked	1,001	0	1,128	5	120	2,254
Barged	21,429	0	16,194	5	504	38,132
<b>Total Transported</b>	<b>22,430</b>	<b>0</b>	<b>17,322</b>	<b>10</b>	<b>624</b>	<b>40,386</b>
<b>LOWER MONUMENTAL DAM</b>						
Collected	50,188	7	7,983	15	449	58,642
Bypassed	154	1	115	0	1	271
Trucked	4,879	6	1,133	0	88	6,106
Barged	31,732	0	5,074	15	239	37,060
<b>Total Transported</b>	<b>36,611</b>	<b>6</b>	<b>6,207</b>	<b>15</b>	<b>327</b>	<b>43,166</b>
<b>M McNARY DAM</b>						
Collected	223,653	14,448	24,046	190	501	262,838
Bypassed	222,818	14,422	24,040	190	501	261,971
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	338,935	14,508	109,302	253	2,124	465,122
Bypassed	224,265	14,423	25,845	191	502	265,226
Trucked	22,327	122	16,539	21	713	39,722
Barged	69,883	20	56,559	40	920	127,422
<b>Total Transported</b>	<b>92,210</b>	<b>142</b>	<b>73,098</b>	<b>61</b>	<b>1,633</b>	<b>167,144</b>

**Transportation Summary Report  
Cumulative Transportation Summary  
through 04/15/99**

	Yearling Chinook	Subyearling Chinook	Steelhead	Coho	Sockeye	Total
<b>LOWER GRANITE DAM</b>						
Collected	53,706	146	68,372	207	1,538	123,969
Bypassed	1,780	0	1,955	1	0	3,736
Trucked	29,736	126	23,030	183	1,219	54,294
Barged	16,722	20	35,291	20	177	52,230
<b>Total Transported</b>	<b>46,458</b>	<b>146</b>	<b>58,321</b>	<b>203</b>	<b>1,396</b>	<b>106,524</b>
<b>LITTLE GOOSE DAM</b>						
Collected	30,908	0	20,964	11	659	52,542
Bypassed	0	0	0	0	0	0
Trucked	1,001	0	1,128	5	120	2,254
Barged	21,429	0	16,194	5	504	38,132
<b>Total Transported</b>	<b>22,430</b>	<b>0</b>	<b>17,322</b>	<b>10</b>	<b>624</b>	<b>40,386</b>
<b>LOWER MONUMENTAL DAM</b>						
Collected	50,188	7	7,983	15	449	58,642
Bypassed	154	1	115	0	1	271
Trucked	4,879	6	1,133	0	88	6,106
Barged	31,732	0	5,074	15	239	37,060
<b>Total Transported</b>	<b>36,611</b>	<b>6</b>	<b>6,207</b>	<b>15</b>	<b>327</b>	<b>43,166</b>
<b>MCNARY DAM</b>						
Collected	227,140	17,248	53,670	190	581	298,829
Bypassed	226,292	17,218	53,660	190	581	297,941
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	361,942	17,401	150,989	423	3,227	533,982
Bypassed	228,226	17,219	55,730	191	582	301,948
Trucked	35,616	132	25,291	188	1,427	62,654
Barged	69,883	20	56,559	40	920	127,422
<b>Total Transported</b>	<b>105,499</b>	<b>152</b>	<b>81,850</b>	<b>228</b>	<b>2,347</b>	<b>190,076</b>