



## Fish Passage Center

# Weekly Report #98 - 1

March 20, 1998

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### SUMMARY OF EVENTS:

**1. Water Supply:** Precipitation for October-February period varied from 63% at flathead to 121% at Harney-Malheur basin. Precipitation in the basin fell within the 80-100% range for the period. Precipitation distribution for March 1-18 shows that the highest precipitation is in Okanogan Basin with 161% and lowest is at Snake River Plain with 38%. Most of the precipitation in the basin fell in 60-100% range.

Warm temperatures and dry conditions resulted in less than average snow water equivalent increases during February. March 1<sup>st</sup> snow water equivalents are 70-80% on the Kootenai, Pend Oreille, Spokane and Clearwater rivers. Above average snow was reported in the Cascade mountains in Washington, southwest Oregon and in most of eastern Oregon. The rest of the basin's snow fell near the average range. Runoff for most of the Columbia-Snake basin fell in the 70 to 90% range during February.

March Final Runoff Volume Forecast reflects the February weather conditions, showing a 2 to 8 % downturn. The exception to this trend is the area from southwest Oregon over to southern Idaho where volumes increased by 2 to 15%. The March Final Volume Forecast for Columbia River above The Dalles is 91.7 MAF for the January-July period, a drop of three percent from last month. This compares to a runoff of 159 MAF for the last water year.

The summary of the Runoff Volume Forecast shows that this year will be below average water year with most sites' runoff in the range of 80-100%. The March mid-month Forecast shows continuation of the decreasing trend from 1-9% in the upper Columbia to 18% at Brownlee.

The summary of the Runoff Volumes for different sites through the January-March period is

given in the following Tables.

Location	Period	January 98 Final		February 98 Final	
		MAF	%	MAF	%
Libby	Apr-Sep	5.88	87	6.01	89
Hungry Horse	Apr-Sep	1.66	76	1.79	82
Grand Coulee	Jan-Jul	54.7	86	57.7	91
The Dalles	Jan-Jul	86.4	82	95.2	90
Lower Granite	Jan-Jul	23.0	77	27.1	91
Dworshak	Apr-Jul	2.2	81	2.3	85
Brownlee	Apr-Jul	3.34	58	5.08	88

Location	Period	March 98 Final		March 98 Midmonth	
		MAF	%	MAF	%
Libby	Apr-Sep	54.8	87	5.31	78
Hungry Horse	Apr-Sep	1.62	74	1.79	82
Grand Coulee	Jan-Jul	54.8	87	54.7	86
The Dalles	Jan-Jul	91.7	87	89.1	84
Lower Granite	Jan-Jul	26.4	89	24.0	81
Dworshak	Apr-Jul	2.0	74	1.96	73
Brownlee	Apr-Jul	5.25	91	4.24	73

**2. System Storage and Streamflow:** The system continues to be operated for flood control purposes. Earlier in the season some of the major reservoirs as Grand Coulee and Dworshak have been drafted below flood control elevations for purposes of maintenance work. These operations will result in failure to refill reservoirs at April 20 to the BiOp required flood control elevations and meet BiOp requested spring flow targets. Fishery Agencies requested some changes in projected operations of Brownlee and Canadian reservoirs in order to mitigate for this inability to provide spring targets at Lower Granite and McNary. Requests have been denied by federal regulat-

ing agencies so far.

Summary of actual elevations and Required Flood Control elevations at the end of March is given in the following table:

Reservoir	Actual Elevation [ft] as of March 18	Max. Reservoir Pool [ft]	End of March Flood Control Elev. [ft]
Libby	2391.0	2459.0	2413.2
Hungry Horse	3505.6	3560.0	3533.1
Grand Coulee	1254.3	1290.0	1283.3
Brownlee	2041.5	2077.0	2049.1
Dworshak	1531.9	1600.0	1578.0

- Libby is projected to be on minimum outflow of 4 kcfs by the end of March in order to refill to end of March Flood Control Elevation.
- Hungry Horse is projected to be on minimum outflow of about 2.5 kcfs required to maintain minimum flow of 4.5 kcfs at Columbia Falls. The reservoir is projected to fill by April 20 to required flood control elevation.
- Grand Coulee is projected to pass inflow in the range of 70-140 kcfs at elevation of 1255 ft because of the maintenance work at drum gates which are planned to be finished by April 5.
- Brownlee is projected to refill to an end of March Flood Control Elevation. Actual outflow is in the range of 28-30 kcfs.
- Dworshak is projected to remain on the minimum outflow of 1.3-1.6 kcfs through April 20 in attempt to refill to BiOp required April 20 Flood Control Elevation.
- Upper Snake reservoirs:
  - Jackson Lake is projected to pass the inflow of 0.6 kcfs by the end of March. Currently the reservoir is 75% full
  - Palisades is projected to be drafted during coming week with increasing flow increments of 100 cfs due to testing of the channel capacity at the Blackfoot Reach. Current outflow is about 7.5 kcfs. Projected test outflows should not exceed 10 kcfs. Currently the reservoir is 73% full.
  - American Falls is projected to store additional 30-35 KAF of the water from upstream by the end of March. Currently reservoir is 91% full with about 135 KAF of empty space.

The projected outflow should not exceed 10.5-11 kcfs.

-Millner flow at the lowest point of Upper Snake system is projected not to exceed 11 kcfs through the end of March.

The average discharge for the run of river projects during March 13-19 period is given in the following Table:

Project	Average Discharge [kcfs]
Priest Rapids	118.5*
McNary	165.6
Lower Granite	42.8
Bonneville	190.2

*\*average flow for the period of March 13-18.*

**3. Spill:** Upon request from the National Marine Fisheries Service the Oregon Department of Environmental Quality and the Washington Department of Ecology have granted waivers to the total dissolved gas standard for the spring and summer migration. Spill will be allowed up to total dissolved gas supersaturation (TDGS) levels of 120% at the tailrace monitors and 115% at the downstream forebay monitors. The Oregon DEQ denied the waiver for the March 13-23 spill period associated with the Spring Creek Hatchery fall chinook release. Consequently, the provision of spill is limited by the 110% total dissolved gas criteria.

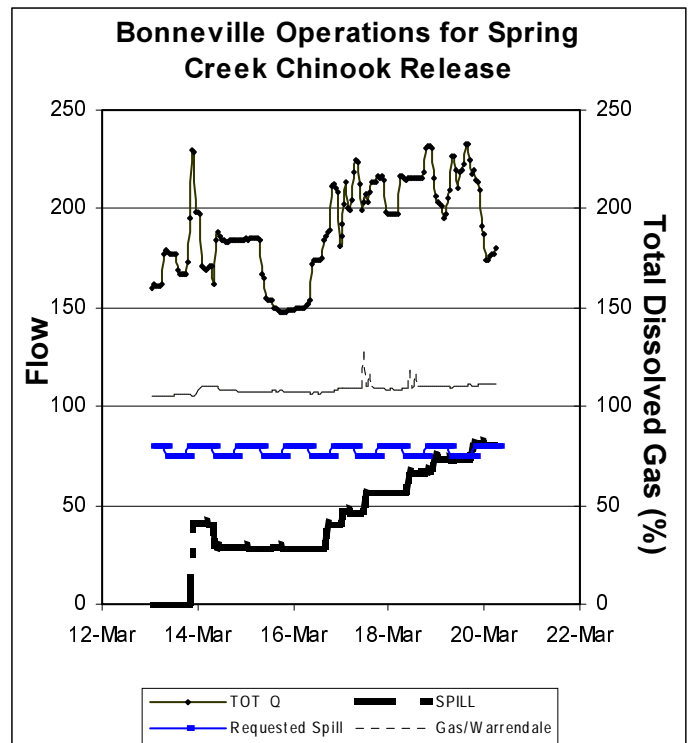
The fishery agencies and tribes submitted System Operational Request #98-5 requesting a spill level of 80 kcfs (the 110% TDGS level) with flat loading of the project at 160 kcfs for a ten-day period after the release. This recommendation was based on protection for both the Spring Creek Hatchery release and the fall and chum chinook redds located below Bonneville Dam. The instantaneous flow of 160 kcfs was based on providing sufficient water depth over the redds to compensate for the impact of the elevated total dissolved gas levels.

As in past years, the COE did not agree to the ten-day period. The COE planned to spill for a seven day period with spill continuing if there are still large numbers of juvenile fish migrating

at that time. The fishery agencies and tribes submitted a subsequent system operational request (SOR #98-7) on March 19, 1998 recommending the continuation of the spill for the ten-day period based on the fish passage pattern. The SOR points out the potential problems associated with trying to use the passage index at Bonneville Dam as absolute measurements.

BPA did not agree to an instantaneous flow of 160 kcfs. The instantaneous 160 kcfs was an increase from the 128.5 kcfs instantaneous minimum provisionally agreed to last December by the Implementation Team (IT). The increased level of flow was based on concerns regarding the effects of elevated total dissolved gas levels on the redds. In addition, this flow was well within the range of flows recently occurring on a daily average basis. The issue for BPA was load following rather than providing an instantaneous flow and the potential that flows could possibly be less than 160 kcfs on a daily average basis. A subsequent IT meeting occurred to address this issue. It was agreed at the IT meeting that spill would be decreased at flows between 150-160 kcfs so as not to exceed a TDGS level of 107% and to 105% TDGS at flows less than 150 kcfs because of concerns regarding the effects of TDGS on the redds.

The hatchery release occurred early on the morning of March 13, 1998. Daily average flow levels exceeded 160 kcfs at Bonneville Dam every day after the release. Spill levels for the Spring Creek Hatchery release were substantially less than requested in SOR #98-5. Spill was limited to 107% TDGS for three days after the release in spite of the agreement at the IT meeting, and was only changed after repeated calls to the RCC by the USFWS and WDFW. Spill did not reach the requested levels until the seventh day after the hatchery release.



**3. Smolt Monitoring:** 1998 smolt monitoring season has begun at the four Snake River drainage traps and Bonneville Dam. Monitoring began March 9 at the Idaho Department of Fish and Game traps on the lower Salmon River (WTB) and Snake River (LEW). The Salmon River Trap is an inclined (scoop) style trap located near the community of Twin Bridges, Idaho, and the Snake River trap is a dipper style trap located off the Lewiston-Clarkston highway bridge. Collection numbers on March 19 show increased movement of both hatchery and wild chinook yearlings at the lower Salmon River trap location. Monitoring began March 5 (following a one day sample February 27) at the Imnaha River trap (IMN) operated by the Nez Perce Tribe. The Imnaha Trap location is approximately 5 miles upstream of the river mouth. The tribe plans to operate two screw traps side-by-side in 1998, thus doubling the sampling effort this year compared to the previous years. Collection numbers beginning March 16 show increased movement of wild chinook yearlings at the lower Imnaha River trap location. Monitoring began March 16 at the Oregon Department of Fish and Wildlife trap on the lower Grande Ronde River. The Grande Ronde River trap

(GRN) is an inclined (scoop) style trap located approximately 2 miles upstream of the river mouth. Low numbers of wild chinook yearlings have been present in the first week of sampling.

Monitoring began March 9 at the first powerhouse of Bonneville Dam. Sampling is conducted by operating a trap for varied durations in the bypass channel over an 8-hr period between 16:00 and 24:00 hours. Samples are expanded hourly to collections and the 8-hr accumulated collection is expanded by the proportion of daily (24-hr) average flow passing through the first powerhouse. The Spring Creek Hatchery tule fall chinook (subyearlings) began arriving in the trap on March 14, a day after release, and have dominated the collections since that date.

**4. Adult Fish Passage:** Fish counting will begin at most dams on April 1. The Mid-Columbia projects normally start counting near April 15 with the exception of Wells Dam which initiates counting on May 1. Bonneville and Lower Granite dams are presently counting adult fish via video taping at the counting windows. Both are using 8-h counts (0800-1600h) for the record until April 1 when 16-h visual counting will begin.

At Lower Granite Dam, the adult count is presently comprised of steelhead that have overwintered in the pools below the project and then begin moving upstream to their natal streams to spawn in the late winter and spring months. The total count through March 14 was 789 for the season and that was about 5% greater than the 10-yr average through the same date.

The slightly warmer water temperature and lower flow levels so far seen in March 1998 may mean that the chinook run will be earlier than the past couple of years in the Columbia River. Numbers of jack spring chinook salmon that returned to the Columbia River in 1997 were less than 1,000 at Bonneville Dam, less than 100 in the Snake River, and less than 50 in the Mid-Columbia River. These jack spring chinook returns were about 5-20% of the 1996 return of jack spring chinook. This will likely result in extremely reduced returns of adult 4-year old (2-ocean) spring chinook in 1998. It is

highly likely that 5-year old fish will be the predominant returning age class in 1998.

The adult spring chinook count at Bonneville Dam was 28 through March 17 and was near the 1997 count of 24 through the same date. Based on previous counts in March, only about 1% of the spring chinook run passes Bonneville Project during this month.

The new powerhouse is still operating with only half the attraction flow as one of the two fish turbines is out of service. The Project expects the service to be back on-line by mid-April. All other adult fish passage facilities at the COE projects in the lower Columbia and Snake River dams are operating at normal criteria. As well, most of the PUD projects are running their adult fish facilities at full capacity.

**5. Hatchery Releases:** In the **Snake River**, yearling spring chinook from Clearwater H. were released below Hells Canyon Dam in the Snake River. The volitional release of spring chinook from Rapid River and Tucannon hatcheries was initiated during the week. Most of the yearling chinook will be released by early April this year.

Yearling coho salmon were released (direct stream release) into Lapwai Creek and Potlatch R. The Nez Perce are also monitoring smolt outmigrants from egg plants made in 1996 from designated streams in the Clearwater River Basin.

Sockeye were released into the upper Salmon River lakes during the fall and a percentage of them will be migrating this spring from Red Fish, Pettit, and Alturas lakes.

Steelhead releases will begin next week with the bulk of the steelhead planted from early April through mid-May. Again, projected steelhead releases will total about 10 million for the 1998 season.

In the **mid-Columbia Reach**, the first release of yearling chinook was completed on March 13 from Similkameen Hatchery located in the Okanogan River basin. Most yearling releases of chinook salmon will be completed in April 98.

At **lower Columbia River** hatcheries (from McNary Dam to above Bonneville Dam), yearling

spring and fall chinook were released into the Umatilla River from Imeques and Thornhollow acclimation ponds, and yearling spring chinook released into the Klickitat River from Klickitat Hatchery. In addition, yearling coho were released into the Klickitat River from Lewis River Hatchery and unconfirmed release of yearling coho into the Umatilla River from Lower Herman Creek Pd.

About 7.7 million subyearling fall chinook were released from Spring Creek NFH during the week. This will be the largest single release of salmon above Bonneville Dam for the year.

### **Please Note!!!**

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Thanks!

**Hatchery Release Summary  
Schedule for Last Two Weeks  
From 03/05/98 to 03/18/98**

Hatchery	Species	FPC LotID	Number Released	Release Dates		Release Site	River Name
				Begin	End		
<b><u>IDFG</u></b>							
Clearwater	SP Chinook	98005	160,100	03/16/98	03/16/98	Hells Canyon Dam	Snake River
	SP Chinook	98006	145,300	03/17/98	03/17/98	Hells Canyon Dam	Snake River
Rapid River	SP Chinook	98007	896,250	03/16/98	04/10/98	Rapid River H	Little Salmon River
	<b>Agency Total:</b>		<b>1,201,650</b>				
<b><u>Nez Perce Tribe</u></b>							
Willard	Coho	98136	250,000	03/16/98	03/16/98	Lapwai Cr	Clearwater River, Main Fk
	Coho	98137	250,000	03/18/98	03/18/98	Potlatch R	Clearwater River, Main Fk
	<b>Agency Total:</b>		<b>500,000</b>				
<b><u>ODFW</u></b>							
Lower Herman C	Coho	98055	500,000	03/10/98	03/20/98	Umatilla R	Umatilla River
	<b>Agency Total:</b>		<b>500,000</b>				
<b><u>Umatilla Tribe</u></b>							
Imeques	SP Chinook	98048	382,713	03/08/98	03/08/98	Imeques Acclim Pd	Umatilla River
	SP Chinook	98049	172,999	03/08/98	03/08/98	Imeques Acclim Pd	Umatilla River
Thornhollow	FA Chinook	98045	256,910	03/13/98	03/13/98	Thornhollow Acclim Pd	Umatilla River
	<b>Agency Total:</b>		<b>812,622</b>				
<b><u>USFWS</u></b>							
Spring Creek	FA Chinook	98073	7,750,000	03/16/98	03/16/98	Spring Creek H	Columbia River
	SP Chinook	98056	350,000	03/16/98	03/16/98	White Salmon R	Columbia River
	<b>Agency Total:</b>		<b>8,100,000</b>				
<b><u>WDFW</u></b>							
Klickitat	SP Chinook	98093	600,000	03/01/98	03/13/98	Klickitat H	Klickitat River
Tucannon	SP Chinook	98039	15,000	03/11/98	04/15/98	Tucannon H	Tucannon River
	SP Chinook	98038	49,000	03/11/98	04/15/98	Curl Lake	Tucannon River
Wells	SU Chinook	98018	539,000	03/13/98	03/20/98	Similkameen Acclim Pd	Okanogan River
	<b>Agency Total:</b>		<b>1,203,000</b>				

**Total Release: 12,317,272**

**Hatchery Release Summary  
Schedule for Next Two Weeks  
From 03/19/98 to 04/01/98**

Hatchery	Species	FPC LotID	Number Released	Release Dates		Release Site	River Name
				Begin	End		
<b><u>IDFG</u></b>							
Clearwater	SP Chinook	98004	8,900	04/01/98	04/15/98	Selway R	Clearwater River, Main Fk
Magic Valley	SU Steelhead	98118	50,000	04/01/98	04/01/98	Squaw Cr Acclim Pd	Salmon River
McCall	SU Chinook	98009	370,000	03/31/98	04/09/98	S Fk Salmon R	Salmon River
	SU Chinook	98010	24,900	04/01/98	04/15/98	S Fk Salmon R	Salmon River
Niagara Springs	SU Steelhead	98120	660,720	03/23/98	04/06/98	Hells Canyon Dam	Snake River
	<b>Agency Total:</b>		<b>1,114,520</b>				
<b><u>Nez Perce Tribe</u></b>							
Lyons Ferry	FA Chinook	98042	147,585	04/01/98	04/15/98	Pittsburg Landing	Snake River
	FA Chinook	98044	135,710	04/01/98	04/15/98	Cpt John Accl Pd	Snake River
	FA Chinook	98043	76,571	04/01/98	04/15/98	Clearwater R	Clearwater River, Main Fk
	<b>Agency Total:</b>		<b>359,866</b>				
<b><u>ODFW</u></b>							
Big Canyon	SU Steelhead	98104	97,500	03/31/98	03/31/98	Big Canyon H	Grande Ronde River
	SU Steelhead	98103	97,500	04/01/98	04/15/98	Big Canyon H	Grande Ronde River
Cascade	Coho	98054	1,000,000	04/01/98	04/10/98	Umatilla R	Umatilla River
Wallowa	SU Steelhead	98102	185,000	03/24/98	03/24/98	Wallowa Acclim Pd	Grande Ronde River
	SU Steelhead	98101	189,500	03/25/98	04/08/98	Wallowa Acclim Pd	Grande Ronde River
	<b>Agency Total:</b>		<b>1,569,500</b>				
<b><u>USFWS</u></b>							
Dworshak	SP Chinook	98014	970,000	03/25/98	03/26/98	Dworshak H	N Fk Clearwater River
Entiat	SP Chinook	98063	357,000	04/01/98	04/15/98	Entiat H	Entiat River
Hagerman	SU Steelhead	98065	60,000	03/31/98	04/30/98	Sawtooth H	Salmon River
	SU Steelhead	98067	605,000	03/31/98	04/30/98	Sawtooth H	Salmon River
Kooskia	SP Chinook	98013	77,000	03/30/98	03/30/98	Kooskia H	Mid Fk Clearwater River
	<b>Agency Total:</b>		<b>2,069,000</b>				
<b><u>WDFW</u></b>							
East Bank	SU Chinook	98016	624,000	04/01/98	05/15/98	Dryden Accl Pd	Wenatchee River
	SP Chinook	98015	15,000	04/01/98	04/30/98	Chiwawa H	Wenatchee River
Lyons Ferry	FA Chinook	98041	450,000	04/01/98	04/15/98	Lyons Ferry H	Snake River
Methow	SU Chinook	98017	346,000	04/01/98	04/30/98	Carlton Accl Pd	Methow River
Tucannon	SP Chinook	98040	15,000	03/23/98	04/03/98	Tucannon R	Tucannon River
Wells	SU Chinook	98027	357,000	04/01/98	04/20/98	Wells	Mid-Columbia River
	<b>Agency Total:</b>		<b>1,807,000</b>				

**Total Release: 6,919,886**

**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
03/06/98	110.9	0.0	114.0	0.0	116.9	0.0	120.6	2.6	116.9	0.0	125.2	0.0	132.2	0.0
03/07/98	93.6	0.0	96.5	0.0	99.3	0.0	105.3	0.0	103.0	0.0	105.3	0.0	109.5	0.0
03/08/98	68.6	0.0	70.3	0.0	73.3	0.0	77.3	0.0	76.0	0.0	78.1	0.0	81.2	0.0
03/09/98	115.7	0.0	116.2	0.0	117.6	0.0	118.0	6.6	112.2	0.0	107.8	0.0	111.9	0.0
03/10/98	136.0	0.0	138.1	0.0	137.9	0.0	146.5	15.9	143.1	0.0	130.7	0.0	140.2	0.0
03/11/98	99.9	0.0	107.7	0.0	111.2	0.0	119.0	0.2	117.5	0.0	130.0	0.0	141.1	0.0
03/12/98	110.9	0.0	112.3	0.0	114.9	0.0	119.1	0.0	116.1	0.0	116.1	0.0	123.8	0.0
03/13/98	97.9	0.0	98.8	0.0	103.1	0.0	107.3	0.0	105.2	0.0	107.1	0.0	114.7	0.0
03/14/98	73.0	0.0	76.3	0.0	79.0	0.0	83.9	0.0	82.7	0.0	86.5	0.0	91.6	0.0
03/15/98	82.5	0.0	84.2	0.0	87.5	0.0	90.2	0.0	88.4	0.0	91.6	0.0	95.2	0.0
03/16/98	127.8	0.0	130.9	0.0	133.3	0.0	134.7	21.8	130.5	0.0	122.5	0.0	132.0	0.0
03/17/98	128.8	0.0	132.1	0.0	135.8	0.0	141.6	20.7	139.9	0.0	135.9	0.0	143.9	0.0
03/18/98	114.3	0.0	121.6	0.0	123.4	0.0	129.5	12.6	128.7	0.0	129.1	0.0	136.1	0.0
03/19/98	112.3	0.0	113.0	0.0	117.8	0.0	122.2	6.2	120.9	0.0	127.7	0.0	134.8	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
03/06/98	1.3	0.0	---	---	36.4	0.0	36.5	0.0	37.8	0.0	35.2	23.5
03/07/98	1.3	0.0	---	---	35.6	0.0	35.0	0.0	35.4	0.0	39.4	23.6
03/08/98	1.3	0.0	---	---	33.3	0.0	30.0	0.0	31.4	0.0	28.6	0.0
03/09/98	1.3	0.0	---	---	46.2	0.0	67.0	0.0	76.1	5.2	80.8	27.9
03/10/98	1.3	0.0	---	---	35.4	0.0	29.4	0.0	28.2	0.0	27.5	0.0
03/11/98	1.3	0.0	---	---	36.6	0.0	32.8	0.0	38.1	0.0	37.6	0.0
03/12/98	1.3	0.0	---	---	37.9	0.0	41.4	0.0	41.9	0.0	43.6	0.0
03/13/98	1.3	0.0	---	---	37.9	0.0	32.4	0.0	33.9	0.0	32.4	0.0
03/14/98	1.3	0.0	---	---	39.4	0.0	38.1	0.0	40.2	0.0	39.3	0.0
03/15/98	1.3	0.0	---	---	41.3	0.0	40.2	1.4	42.0	0.0	42.3	0.0
03/16/98	1.3	0.0	---	---	47.7	0.0	48.3	0.1	49.3	0.0	47.4	0.0
03/17/98	1.3	0.0	---	---	44.0	0.0	44.2	0.0	49.7	0.0	50.2	0.0
03/18/98	1.4	0.0	---	---	42.9	0.0	42.8	0.0	44.5	0.0	41.5	0.0
03/19/98	1.6	0.0	---	---	46.3	0.0	44.7	0.0	45.6	0.0	48.5	0.0

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

Date	McNary		John Day		The Dalles		Bonneville			
	Flow	Spill	Flow	Spill	Flow	Spill	Flow	Spill	PH1	PH2
03/06/98	161.4	0.0	192.1	0.0	192.4	0.0	204.4	0.0	63.3	135.9
03/07/98	156.5	0.0	156.7	0.0	161.4	0.0	174.7	0.0	44.7	124.8
03/08/98	140.0	0.0	170.0	0.0	168.2	0.0	161.2	0.0	37.9	118.1
03/09/98	154.9	0.0	147.4	0.0	148.6	0.0	173.6	0.0	52.2	116.2
03/10/98	155.6	0.0	174.0	0.0	170.4	0.0	164.3	0.0	42.8	116.3
03/11/98	164.2	0.0	173.6	0.0	173.4	0.0	180.2	0.0	63.9	107.6
03/12/98	157.5	0.0	159.8	0.0	156.8	0.0	176.6	0.0	66.5	101.2
03/13/98	166.7	0.0	184.8	0.0	185.5	0.0	178.0	6.8	60.5	101.7
03/14/98	150.2	0.0	159.4	0.0	157.6	0.0	180.5	32.5	66.9	72.2
03/15/98	127.5	0.0	136.8	0.0	134.5	0.0	161.4	28.8	59.9	63.5
03/16/98	159.4	0.0	168.5	0.0	167.3	0.0	175.3	33.0	65.7	67.4
03/17/98	179.2	14.7	186.4	0.0	184.9	0.0	208.9	51.9	69.3	78.5
03/18/98	195.4	20.0	205.7	0.0	206.0	0.0	214.2	63.7	64.6	76.7
03/19/98	180.9	8.0	197.2	0.0	194.2	0.0	213.3	75.4	60.3	68.4



**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>Tlwr G. Coulee</u>				<u>Chief Joseph</u>				<u>Wells</u>			<u>Rocky Reach</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>	<u>24 h</u>	<u>12 h</u>	<u>#</u>			
	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>
3/6	100	101	101	24	102	103	103	23	101	101	102	23	---	---	---	0	---	---	---	0	---	---	---	0
3/7	100	100	101	24	102	103	103	23	101	101	102	23	---	---	---	0	---	---	---	0	---	---	---	0
3/8	99	99	99	24	102	103	103	23	102	102	103	23	---	---	---	0	---	---	---	0	---	---	---	0
3/9	99	100	101	24	102	102	102	23	101	101	102	23	---	---	---	0	---	---	---	0	---	---	---	0
3/10	100	101	101	24	102	102	103	23	101	101	101	23	---	---	---	0	---	---	---	0	---	---	---	0
3/11	101	102	103	24	103	103	104	23	101	101	102	23	---	---	---	0	---	---	---	0	---	---	---	0
3/12	103	103	104	24	103	104	105	23	102	102	103	23	---	---	---	0	---	---	---	0	---	---	---	0
3/13	103	103	104	24	104	105	106	23	102	102	104	23	---	---	---	0	---	---	---	0	---	---	---	0
3/14	102	102	102	24	104	104	105	23	102	103	103	23	---	---	---	0	---	---	---	0	---	---	---	0
3/15	102	102	103	24	104	105	106	23	102	103	104	23	---	---	---	0	---	---	---	0	---	---	---	0
3/16	102	102	103	24	104	104	105	23	102	102	103	23	---	---	---	0	---	---	---	0	---	---	---	0
3/17	102	102	103	20	103	103	103	23	101	101	102	23	---	---	---	0	---	---	---	0	---	---	---	0
3/18	102	102	103	24	103	103	104	23	101	101	102	23	---	---	---	0	---	---	---	0	---	---	---	0
3/19	102	102	102	24	103	104	105	23	101	101	102	23	---	---	---	0	---	---	---	0	---	---	---	0

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

Date	<u>Tlwr. Rocky R.</u>			<u>Rock Island</u>				<u>Tlwr. Rock Island</u>				<u>Wanapum</u>			<u>Tlwr Wanapum</u>			<u>Priest Rapids</u>						
	<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>	<u>24 h</u>	<u>12 h</u>	<u>#</u>			
	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>
3/6	---	---	---	0	---	---	---	0	---	---	---	0	103	103	103	23	102	103	103	23	107	109	115	23
3/7	---	---	---	0	---	---	---	0	---	---	---	0	101	102	102	23	101	102	102	23	105	105	105	23
3/8	---	---	---	0	---	---	---	0	---	---	---	0	101	102	102	23	101	101	102	23	103	103	104	23
3/9	---	---	---	0	---	---	---	0	---	---	---	0	101	101	102	23	101	101	101	23	103	103	103	23
3/10	---	---	---	0	---	---	---	0	---	---	---	0	101	101	101	23	101	101	101	23	102	103	103	23
3/11	---	---	---	0	---	---	---	0	---	---	---	0	101	101	102	23	101	101	101	23	102	102	103	23
3/12	---	---	---	0	---	---	---	0	---	---	---	0	102	103	103	23	102	103	103	23	103	104	104	23
3/13	---	---	---	0	---	---	---	0	---	---	---	0	103	104	105	23	103	103	104	22	104	104	105	23
3/14	---	---	---	0	---	---	---	0	---	---	---	0	104	104	104	23	104	104	105	23	104	105	106	23
3/15	---	---	---	0	---	---	---	0	---	---	---	0	103	103	103	23	103	103	103	23	105	106	107	23
3/16	---	---	---	0	---	---	---	0	---	---	---	0	102	103	103	23	102	103	103	23	104	105	105	23
3/17	---	---	---	0	---	---	---	0	---	---	---	0	102	102	103	23	102	102	102	22	103	103	103	23
3/18	---	---	---	0	---	---	---	0	---	---	---	0	102	102	103	23	102	102	103	23	103	103	104	23
3/19	---	---	---	0	---	---	---	0	---	---	---	0	104	105	106	23	104	105	105	23	104	105	105	23

**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>Tlwr L. Granite</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>	<u>24 h</u>	<u>12 h</u>	<u>#</u>			
	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>	<u>Avg</u>	<u>Avg</u>	<u>High</u>	<u>hr</u>
3/6	---	---	---	0	105	105	106	12	---	---	---	0	---	---	---	0	103	103	103	24	102	102	102	24
3/7	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	102	102	102	2	101	101	101	2
3/8	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	102	102	102	24	101	101	102	24
3/9	---	---	---	0	106	107	107	24	---	---	---	0	---	---	---	0	101	101	102	21	101	103	110	24
3/10	---	---	---	0	105	106	107	24	---	---	---	0	---	---	---	0	101	102	102	24	101	102	104	24
3/11	---	---	---	0	106	106	107	24	---	---	---	0	---	---	---	0	102	102	103	24	101	102	103	24
3/12	---	---	---	0	106	107	108	24	---	---	---	0	---	---	---	0	103	103	103	2	101	101	101	2
3/13	---	---	---	0	106	108	111	24	---	---	---	0	---	---	---	0	104	105	105	24	103	103	103	24
3/14	---	---	---	0	108	109	113	24	---	---	---	0	---	---	---	0	104	105	106	24	103	103	104	24
3/15	---	---	---	0	107	108	108	24	---	---	---	0	---	---	---	0	105	105	105	2	103	103	103	2
3/16	---	---	---	0	112	115	115	24	---	---	---	0	---	---	---	0	104	105	105	24	104	104	104	24
3/17	---	---	---	0	116	116	116	24	---	---	---	0	---	---	---	0	103	103	104	24	103	103	103	24
3/18	---	---	---	0	115	115	116	6	---	---	---	0	---	---	---	0	103	104	106	24	102	102	102	24
3/19	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	103	104	104	24	102	102	103	24

<sup>1</sup> Data provided by the Corps of Engineers

<sup>2</sup> Dissolved gas readings and averages have been rounded to the nearest integer.

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>Tlwr L. Goose</u>			<u>Lower Mon.</u>			<u>Tlwr L. Mon</u>			<u>Ice Harbor</u>			<u>Tlwr Ice Harbor</u>								
	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>						
	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr				
3/6	---	---	---	0	---	---	---	0	101	101	102	24	---	---	---	0	101	101	102	24	107	112	117	24
3/7	---	---	---	0	---	---	---	0	100	100	101	24	---	---	---	0	101	101	101	24	107	112	117	24
3/8	---	---	---	0	---	---	---	0	100	100	101	24	---	---	---	0	100	101	101	24	101	101	102	24
3/9	---	---	---	0	---	---	---	0	99	99	100	24	---	---	---	0	100	100	100	24	109	115	119	24
3/10	---	---	---	0	---	---	---	0	100	100	100	24	---	---	---	0	99	100	100	24	100	100	101	24
3/11	---	---	---	0	---	---	---	0	101	101	104	24	---	---	---	0	100	101	103	24	100	101	101	24
3/12	---	---	---	0	---	---	---	0	102	102	102	2	---	---	---	0	101	102	103	24	101	102	102	24
3/13	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	103	103	104	24	102	103	103	24
3/14	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	102	103	104	24	102	102	103	24
3/15	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	102	102	103	24	102	102	102	24
3/16	---	---	---	0	---	---	---	0	103	103	104	24	---	---	---	0	102	102	102	14	102	103	104	14
3/17	---	---	---	0	---	---	---	0	102	103	103	24	---	---	---	0	101	101	102	24	102	102	103	24
3/18	---	---	---	0	---	---	---	0	103	103	104	24	---	---	---	0	102	102	104	24	102	102	102	24
3/19	---	---	---	0	---	---	---	0	103	103	104	24	---	---	---	0	102	103	105	24	102	103	103	24

Total Dissolved Gas Saturation Data at Lower Columbia Sites

Date	<u>McNary-Oregon</u>			<u>McNary-Wash.</u>			<u>Tlwr McNary</u>			<u>John Day</u>			<u>Tlwr John Day</u>			<u>The Dalles</u>								
	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>						
	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr				
3/6	103	104	104	24	103	103	104	24	103	103	103	24	---	---	---	0	---	---	---	0	---	---	---	0
3/7	103	104	104	24	103	103	104	24	103	104	104	24	---	---	---	0	---	---	---	0	---	---	---	0
3/8	104	105	105	24	105	106	106	24	105	106	106	24	---	---	---	0	---	---	---	0	---	---	---	0
3/9	105	105	106	24	105	106	106	24	105	106	106	24	---	---	---	0	---	---	---	0	---	---	---	0
3/10	106	106	107	24	106	106	106	24	105	106	106	24	---	---	---	0	---	---	---	0	---	---	---	0
3/11	104	104	106	7	104	104	105	7	104	104	104	7	---	---	---	0	---	---	---	0	---	---	---	0
3/12	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0	---	---	---	0
3/13	105	106	108	24	105	106	107	24	104	104	105	24	---	---	---	0	---	---	---	0	---	---	---	0
3/14	104	105	105	24	104	105	105	24	104	104	104	24	---	---	---	0	---	---	---	0	---	---	---	0
3/15	104	104	104	2	105	105	105	2	104	104	104	2	---	---	---	0	---	---	---	0	---	---	---	0
3/16	104	105	105	24	104	105	105	24	104	104	105	24	---	---	---	0	---	---	---	0	---	---	---	0
3/17	104	104	105	24	104	104	104	24	107	110	111	24	---	---	---	0	---	---	---	0	---	---	---	0
3/18	103	104	105	24	104	105	106	24	110	110	111	24	---	---	---	0	---	---	---	0	---	---	---	0
3/19	103	104	104	24	104	104	105	24	107	109	110	24	---	---	---	0	---	---	---	0	---	---	---	0

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>Camas/Wash.</u>			<u>Wauna Mill</u>								
	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>	<u>24 h</u>	<u>12 h</u>	<u>#</u>						
	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr	Avg	Avg	High	hr				
3/6	---	---	---	0	102	102	103	24	102	103	103	24	102	102	103	24	100	101	101	22	103	104	104	23
3/7	---	---	---	0	102	103	103	24	103	103	103	24	102	102	103	24	100	101	102	22	104	104	104	23
3/8	---	---	---	0	102	103	103	24	103	103	104	24	102	102	103	24	101	101	101	21	103	103	104	23
3/9	---	---	---	0	103	103	103	24	103	103	103	24	102	102	103	24	101	101	101	22	103	103	103	23
3/10	---	---	---	0	103	103	103	24	103	104	104	24	103	103	103	23	102	102	103	19	103	103	103	23
3/11	---	---	---	0	104	104	105	24	105	105	106	24	104	104	105	24	104	105	105	23	104	104	105	23
3/12	---	---	---	0	105	105	105	24	106	106	106	24	105	105	105	24	104	105	105	23	105	105	105	23
3/13	---	---	---	0	105	105	105	24	106	106	109	24	105	105	106	24	105	106	106	23	105	105	106	23
3/14	---	---	---	0	105	105	105	24	109	110	110	24	107	107	108	24	107	109	110	23	105	105	105	23
3/15	---	---	---	0	105	105	105	24	107	108	108	24	106	106	107	24	107	107	108	23	105	105	106	23
3/16	---	---	---	0	105	105	105	24	107	108	109	24	106	107	108	24	107	107	108	23	105	105	106	23
3/17	---	---	---	0	104	104	104	24	111	112	127	24	115	122	122	24	107	109	110	23	106	106	107	23
3/18	---	---	---	0	104	105	105	24	110	112	119	24	114	120	122	24	108	108	109	23	106	107	107	23
3/19	---	---	---	0	105	105	106	24	110	111	112	24	108	109	110	24	107	108	108	23	107	108	108	23

<sup>1</sup> Data provided by the Corps of Engineers

<sup>2</sup> Dissolved gas readings and averages have been rounded to the nearest integer.

# Two-Week Summary of Passage Indices

Date	Yearling Chinook							Hatchery/Wild Combined			
	Hatchery							RIS	MCN	JDA	BO1
	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)				
03/06/98	---	0	---	---	---	---	---	---	---	---	---
03/07/98	---	---	---	---	---	---	---	---	---	---	---
03/08/98	---	---	---	---	---	---	---	---	---	---	---
03/09/98	---	0	---	0	---	---	---	---	---	---	39
03/10/98	0	0	---	0	---	---	---	---	---	---	59
03/11/98	0	0	---	0	---	---	---	---	---	---	---
03/12/98	0	0	---	0	---	---	---	---	---	---	40
03/13/98	0	0	---	0	---	---	---	---	---	---	134
03/14/98	---	---	---	---	---	---	---	---	---	---	610
03/15/98	---	---	---	---	---	---	---	---	---	---	152
03/16/98	---	0	0	0	---	---	---	---	---	---	76
03/17/98	4	0	0	0	---	---	---	---	---	---	259
03/18/98	---	0	0	0	---	---	---	---	---	---	238
03/19/98	168	0	0	1	---	---	---	---	---	---	220
<b>Total:</b>	172	0	0	1	0	0	0	0	0	0	1,827
<b># Days:</b>	6	10	4	9	0	0	0	0	0	0	10
<b>Average:</b>	29	0	0	0	0	0	0	0	0	0	183

Date	Wild Yearling Chinook							Wild Subyearling Chinook		
	WTB (Coll)	IMN (Coll)	GRN (Coll)	LEW (Coll)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)	LGR (INDEX)	LGS (INDEX)	LMN (INDEX)
03/06/98	---	5	---	---	---	---	---	---	---	---
03/07/98	---	---	---	---	---	---	---	---	---	---
03/08/98	---	---	---	---	---	---	---	---	---	---
03/09/98	---	4	---	0	---	---	---	---	---	---
03/10/98	0	2	---	0	---	---	---	---	---	---
03/11/98	0	0	---	0	---	---	---	---	---	---
03/12/98	0	4	---	0	---	---	---	---	---	---
03/13/98	0	10	---	0	---	---	---	---	---	---
03/14/98	---	---	---	---	---	---	---	---	---	---
03/15/98	---	---	---	---	---	---	---	---	---	---
03/16/98	---	239	14	0	---	---	---	---	---	---
03/17/98	2	464	10	0	---	---	---	---	---	---
03/18/98	---	501	20	0	---	---	---	---	---	---
03/19/98	61	317	14	1	---	---	---	---	---	---
<b>Total:</b>	63	1,546	58	1	0	0	0	0	0	0
<b># Days:</b>	6	10	4	9	0	0	0	0	0	0
<b>Average:</b>	11	155	15	0	0	0	0	0	0	0

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## 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)
03/06/98	---	0	---	---	0	---	---	---	---	---	---
03/07/98	---	---	---	---	---	---	---	---	---	---	---
03/08/98	---	---	---	---	0	---	---	---	---	---	---
03/09/98	---	0	---	0	---	---	---	---	---	---	0
03/10/98	0	0	---	0	---	---	---	---	---	---	15
03/11/98	0	0	---	0	0	---	---	---	---	---	---
03/12/98	0	0	---	0	---	---	---	---	---	---	50
03/13/98	0	0	---	0	---	---	---	---	---	---	67
03/14/98	---	---	---	---	---	---	---	---	---	---	68,537
03/15/98	---	---	---	---	---	---	---	---	---	---	97,799
03/16/98	---	0	0	0	---	---	---	---	---	---	29,807
03/17/98	0	0	0	0	---	---	---	---	---	---	11,368
03/18/98	---	0	0	0	---	---	---	---	---	---	9,790
03/19/98	0	0	0	0	---	---	---	---	---	---	3,740
<b>Total:</b>	0	0	0	0	0	0	0	0	0	0	221,173
<b># Days:</b>	6	10	4	9	3	0	0	0	0	0	10
<b>Average:</b>	0	0	0	0	0	0	0	0	0	0	22,117

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)
03/06/98	---	0	---	---	---	---	---	---	---	---	---
03/07/98	---	---	---	---	---	---	---	---	---	---	---
03/08/98	---	---	---	---	---	---	---	---	---	---	---
03/09/98	---	0	---	0	---	---	---	---	---	---	0
03/10/98	0	0	---	0	---	---	---	---	---	---	0
03/11/98	0	0	---	0	---	---	---	---	---	---	---
03/12/98	0	0	---	0	---	---	---	---	---	---	0
03/13/98	0	0	---	0	---	---	---	---	---	---	0
03/14/98	---	---	---	---	---	---	---	---	---	---	0
03/15/98	---	---	---	---	---	---	---	---	---	---	0
03/16/98	---	0	0	0	---	---	---	---	---	---	303
03/17/98	0	0	0	0	---	---	---	---	---	---	0
03/18/98	---	0	0	0	---	---	---	---	---	---	0
03/19/98	0	0	0	0	---	---	---	---	---	---	34
<b>Total:</b>	0	0	0	0	0	0	0	0	0	0	337
<b># Days:</b>	6	10	4	9	0	0	0	0	0	0	10
<b>Average:</b>	0	0	0	0	0	0	0	0	0	0	34

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## 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)	
03/06/98	---	0	---	---	---	---	---	---	---	---	---	
03/07/98	---	---	---	---	---	---	---	---	---	---	---	
03/08/98	---	---	---	---	---	---	---	---	---	---	---	
03/09/98	---	0	---	0	---	---	---	---	---	---	0	
03/10/98	0	0	---	0	---	---	---	---	---	---	0	
03/11/98	0	0	---	0	---	---	---	---	---	---	---	
03/12/98	0	0	---	0	---	---	---	---	---	---	0	
03/13/98	0	0	---	0	---	---	---	---	---	---	0	
03/14/98	---	---	---	---	---	---	---	---	---	---	0	
03/15/98	---	---	---	---	---	---	---	---	---	---	0	
03/16/98	---	0	0	0	---	---	---	---	---	---	0	
03/17/98	0	0	0	0	---	---	---	---	---	---	0	
03/18/98	---	0	0	0	---	---	---	---	---	---	0	
03/19/98	0	0	0	0	---	---	---	---	---	---	0	
<b>Total:</b>	0	0	0	0	0	0	0	0	0	0	0	
<b># Days:</b>	6	10	4	9	0	0	0	0	0	0	10	
<b>Average:</b>	0	0	0	0	0	0	0	0	0	0	0	

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)	
03/06/98	---	0	---	---	---	---	---	---	---	---	---	
03/07/98	---	---	---	---	---	---	---	---	---	---	---	
03/08/98	---	---	---	---	---	---	---	---	---	---	---	
03/09/98	---	0	---	0	---	---	---	---	---	---	0	
03/10/98	0	1	---	1	---	---	---	---	---	---	0	
03/11/98	0	0	---	0	---	---	---	---	---	---	---	
03/12/98	0	0	---	0	---	---	---	---	---	---	0	
03/13/98	0	0	---	0	---	---	---	---	---	---	0	
03/14/98	---	---	---	---	---	---	---	---	---	---	0	
03/15/98	---	---	---	---	---	---	---	---	---	---	0	
03/16/98	---	2	1	0	---	---	---	---	---	---	0	
03/17/98	0	15	1	0	---	---	---	---	---	---	0	
03/18/98	---	24	1	1	---	---	---	---	---	---	0	
03/19/98	0	9	1	1	---	---	---	---	---	---	0	
<b>Total:</b>	0	51	4	3	0	0	0	0	0	0	0	
<b># Days:</b>	6	10	4	9	0	0	0	0	0	0	10	
<b>Average:</b>	0	5	1	0	0	0	0	0	0	0	0	

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## 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)
03/06/98	---	0	---	---	---	---	---	---	---	---	---
03/07/98	---	---	---	---	---	---	---	---	---	---	---
03/08/98	---	---	---	---	---	---	---	---	---	---	---
03/09/98	---	0	---	0	---	---	---	---	---	---	0
03/10/98	0	0	---	0	---	---	---	---	---	---	0
03/11/98	0	0	---	0	---	---	---	---	---	---	---
03/12/98	0	0	---	0	---	---	---	---	---	---	0
03/13/98	0	0	---	0	---	---	---	---	---	---	0
03/14/98	---	---	---	---	---	---	---	---	---	---	0
03/15/98	---	---	---	---	---	---	---	---	---	---	0
03/16/98	---	0	0	0	---	---	---	---	---	---	0
03/17/98	0	0	0	0	---	---	---	---	---	---	0
03/18/98	---	0	0	0	---	---	---	---	---	---	0
03/19/98	0	0	0	0	---	---	---	---	---	---	0
<b>Total:</b>	0	0	0	0	0	0	0	0	0	0	0
<b># Days:</b>	6	10	4	9	0	0	0	0	0	0	10
<b>Average:</b>	0	0	0	0	0	0	0	0	0	0	0

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)
03/06/98	---	0	---	---	---	---	---	---	---	---	---
03/07/98	---	---	---	---	---	---	---	---	---	---	---
03/08/98	---	---	---	---	---	---	---	---	---	---	---
03/09/98	---	0	---	0	---	---	---	---	---	---	0
03/10/98	0	0	---	0	---	---	---	---	---	---	0
03/11/98	0	0	---	0	---	---	---	---	---	---	---
03/12/98	0	0	---	0	---	---	---	---	---	---	0
03/13/98	0	0	---	0	---	---	---	---	---	---	0
03/14/98	---	---	---	---	---	---	---	---	---	---	0
03/15/98	---	---	---	---	---	---	---	---	---	---	0
03/16/98	---	0	0	0	---	---	---	---	---	---	0
03/17/98	0	0	0	0	---	---	---	---	---	---	0
03/18/98	---	0	0	0	---	---	---	---	---	---	0
03/19/98	0	0	0	0	---	---	---	---	---	---	0
<b>Total:</b>	0	0	0	0	0	0	0	0	0	0	0
<b># Days:</b>	6	10	4	9	0	0	0	0	0	0	10
<b>Average:</b>	0	0	0	0	0	0	0	0	0	0	0

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Adult Fish Counts of Chinook and Steelhead at Bonneville & Lower Granite Dams

	<b>Chinook</b>			<b>Steelhead</b>		
<b>Site</b>	<b>1998</b>	<b>1997</b>	<b>10-yr Ave</b>	<b>1998</b>	<b>1997</b>	<b>10-yr Ave</b>
<b>Bonneville</b>	28	112	44	68	147	164
<b>Lower Granite</b>	0	0	0	789	848	740

1998 counts are through 3/14 at Lower Granite Dam.

1998 counts are through 3/17 at Bonneville Dam.

The U. S. Army Corps of Engineers provided all fish count data for 1998 and previous years.