

COLUMBIA RIVER WATER MANAGEMENT GROUP

MEETING NO. 493

1. ATTENDANCE

The following met at 9:30 a.m., on Wednesday, June 10, 1998, in Richland, WA

Members or Alternates Present

Ted Day, US Bureau of Reclamation, Chair
 Roger Ross, Corps of Engineers
 Nancy Stephan, Bonneville Power Administration
 Ed Hubbard, U.S. Geological Survey

Others Present

Dušica Jevremović, Fish Passage Center
 Nengjin Liu, Idaho Power Co
 John Roache, US Bur of Reclamation
 Dennis Mekkers, Corps of Engineers (NWS)
 Cheryl Woodall, Corps of Engineers (NWD-NP)

Members Not Present or Represented

Tom Fero, National Weather Service-RFC
 Dan Moore, Natural Resources Conservation Svc
 Doug McChesney, Washington Dept of Ecology
 Walter Boyle, Federal Energy Regulatory Comm
 Jack Gakstatter, U.S. Environ'l Protection Agy
 Bruce McCammon, U.S. Forest Service
 Marvin Yoshinaka, U.S. Fish and Wildlife Service
 Bill Brooks, Bureau of Land Management
 _____, National Marine Fisheries Svc
 B Ondrechen, Idaho Dpt Water Resources & Cons
 Barry Norris, Oregon Water Resources Dept
 Mike Turnipseed, Nevada State Engineer
 Gordon Fassett, Wyoming State Engineer
 Jack Stults, Montana Dept of Natural Res & Cons

2. MINUTES OF LAST MEETING

The minutes of the last month's meeting, as well as future issues, will be released on the Internet (in lieu of mailed hard copy) about mid-month at:

<http://www.nwd-wc.usace.army.mil/crwmng.htm>.

3. WEATHER SUMMARY

May was quite wet throughout most of the basin, with only the Washington coast, northern Washington Cascades, and the Columbia basin above Arrow Lakes being below normal (Enc 1). Sub-basin totals ranged from 92% of normal for the Columbia Basin above Castlegar to 575% for the Upper Deschutes/Crooked sub-basin; with individual stations having greater extremes. Mean basin temperatures were 0.9°F above normal with individual stations ranging from +7.5°F to -3.5°F from normal. Numerous daily maximum temperature records were set.

Monthly and seasonal precipitation amounts, in percent of normal, are given below.

<u>Basin</u>	<u>May</u>	<u>Oct-May</u>	<u>Basin</u>	<u>May</u>	<u>Oct-May</u>
Above Grand Coulee	176%	94%	Kootenai	215%	96%
Above Ice Harbor	235%	112%	Clearwater	179%	95%
Above The Dalles	201%	101%	Pend Oreille/Spokane	223%	99%
Willamette	217%	102%	Rogue	326%	125%

(The Water Supply Outlook will be published on www.nwrfc.noaa.gov beginning in October 1998.)

4. FLOODING

Unprecedented heavy May rains, 25% of the normal annual amount in 28 hours, fell over the Crooked River Basin near Prineville in central Oregon resulted in near record inflows into Ochoco and Prineville reservoirs, according to Ted Day (Enc 2). Both reservoirs, operating according to their rule curves, were full and waiting the beginning of the irrigation season. Both reservoirs reduced the flood peaks (by 500 cfs and 5,105 cfs,

respectively) by surcharging 2.8 ft and 6.5 ft, respectively.

5. SNOWPACK

Most basin snowpacks were depleted during May with snow remaining only in high elevation areas.

6. SWSI

Most Oregon sub-regions show marked increases of 0.6 to 1.1 from last month and are generally in the normal or above range (Enc 3).

7. STREAMFLOW

All index streamflows stations, except the northern coastal rivers, showed increased flows over last month, according to Ed Hubbard (Enc 4). The greatest *flow increase* was on the Umpqua River which was 206% over the previous month, the greatest average flow for the year-to-date was 120% for the Snake River at Weiser in western Idaho. The lowest flow was 73% on the Wilson River near Tillamook, Oregon.

8. RUNOFF VOLUME FORECASTS

The forecasts increased this month, reflecting the above normal precipitation. The most probable forecasts (Enc 1) varied from highs of 105% to 110% in northeastern Washington to lows of 69% in parts of the Snake River Plain. Selected forecasts for key basins in maf, are:

	<u>January-July</u>	<u>April-July</u>	<u>April-Sept</u>
Columbia at Grand Coulee	59.3 (94%)		
Snake at Lower Granite	29.9 (101%)	22.3 (103%)	
Columbia at The Dalles	101.0 (95%)		94.0 (95%)
Libby	6.01 (94%)		6.31 (93%)
Hungry Horse	1.80 (79%)		1.71 (78%)
Dworshak (NWS)	2.89 (81%)	2.13 (79%)	2.27 (79%)
Dworshak - Official (Enc 5)		1.93 (72%)	
Brownlee		7.25 (125%)	

The Corps' official Dworshak forecast procedure was developed by the NRCS and includes an El Niño factor and can be found on the Corps' NWD-WC web site at:

<http://www.nwd-wc.usace.army.mil/cgi-bin/report.pl?dwrf.txt>

9. RESERVOIR OPERATION

The water supply for the upcoming irrigation season is above normal, according to Ted Day (Enc 6).

Grand Coulee is expected to be full in June, flash boards are being installed on the **Hungry Horse** to avoid spilling, it also has on unit OOS (out of service), the **Boise system** is nearly full, and the **Yakima projects** are at full capacity.

Active content available at the end of May at 52 irrigation reservoirs (excluding Grand Coulee and Hungry Horse) was 9,744,600 af–95% of capacity, 820,100 af more than last year, and 1,531,300 af more than normal, at **Franklin D Roosevelt Lake (Grand Coulee Dam)** the active content was approximately 4,789,400 af–92% of capacity, 2,390,800 af more than last year, and 2,211,600 af more than normal, and at **Hungry Horse** the active content was 2,789,900 af–94% of capacity, 745,300 af more than last year, and 577,200 af more than normal.

Cheryl Woodall reported on the operation of the Corps' projects (Enc 7). **Libby** filled 40.6 ft during May and discharged at full powerhouse capacity (21.6 kcfs) for three days for sturgeon spawning. **Lake Pend Oreille (Albeni Falls)** surcharged slightly due to heavy rains at the end of May but was quickly drafted back to full pool. **Dworshak** discharged minimum outflow until the 19th when flows were increased to slow reservoir filling; full pool was reached on June 4. The **Lower Snake Projects, Ice Harbor, Lower Monumental, Little Goose, and**

Lower Granite were operated at their minimum operating pool (mop) levels (**Ice Harbor** operates one foot higher because of a navigation constraint below Lower Monumental).

The **Willamette basin projects** have filled to at or near their maximum conservation level.

Nengjin Liu said that **Brownlee** was near full at 2076.8 ft, inflow was near 48 kcfs and outflow was near 50 kcfs. The May peak flow from snowmelt was 91 kcfs and the annual peak flow of 105 kcfs occurred in January.

10. POWER OPERATIONS

BPA has elected not to report any generating information at the CRWMG meetings.

11. FISHERIES

The flow targets required by the BiOp for McNary and Lower Granite were exceeded during May, according to Dušica Jevremović (Enc 8). There was spilling for juvenile salmon at lower Columbia and Snake river projects.

12. OTHER

The meeting was preceded by tours of fish facilities at Bonneville, The Dalles, and McNary dams and the acoustic velocity meter (AVM) downstream of The Dalles Dam. The Washington Public Power Supply System's WNP2 (nuclear power plant) was toured on the following day (Enc 9).

13. NEXT MEETINGS

The next meeting is scheduled for July 14 at 9:30 a.m., in the Custom House, Room 118.

Roger L. Ross
Secretary

Enclosures

1. Weather Summary
2. Prineville Flood
3. SWSI Oregon
4. Streamflow Summary
5. Dworshak Forecast
6. USBR Project Summary
7. Corps Project Summary
8. FPC report
9. Summary of tour.

**NORTHWEST RIVER FORECAST CENTER - PORTLAND, OREGON
COLUMBIA BASIN PRECIPITATION (MONTHLY SUMMARY)**

COLUMBIA BASIN DIVISION AVERAGES OF SEASONAL PRECIPITATION

DIVISION	..MAY TO DAY 31..		OCT - MAY....		
	OBSD	DEP	PCT AV	OBSD	DEP	PCT AV
COLUMBIA ABOVE COULEE	3.74	1.6	176.	17.15	-1.10	94.
SNAKE RV AB ICE HARBOR	4.02	2.31	235.	15.21	1.66	112.
COLUMBIA AB THE DALLES	3.66	1.84	201.	17.93	.18	101.
COLUMBIA AB CASTLEGAR	1.99	-.18	92.	22.23	-2.04	92.
KOOTENAI	4.40	2.35	215.	17.65	-.66	96.
CLARK FORK	3.40	1.45	174.	11.65	-.75	94.
FLATHEAD	3.88	1.48	161.	14.64	-1.77	89.
PEND OREILLE/ SPOKANE	4.99	2.75	223.	23.79	-.31	99.
NORTHEAST WASHINGTON	5.43	3.57	292.	17.79	3.79	127.
OKANOGAN	2.33	1.03	180.	13.39	2.50	123.
EAST SLOPES WASH CASC.	2.86	1.40	196.	35.13	.78	102.
CENTRAL WASHINGTON	1.25	.56	181.	7.87	.80	111.
UPPER SNAKE	2.84	.67	131.	15.47	.42	103.
SNAKE RIVER PLAIN	3.12	1.80	236.	9.20	.81	110.
OWYHEE/ MALHEUR	3.74	2.56	317.	12.08	3.30	138.
SALMON/ BOISE/ PAYETTE	5.00	3.42	317.	18.08	1.91	112.
BURNT/ GRANDE RONDE	5.08	3.59	341.	15.35	2.88	123.
CLEARWATER	5.01	2.21	179.	22.95	-1.27	95.
SOUTHEAST WASHINGTON	3.50	1.94	225.	15.22	.17	101.
UPPER JOHN DAY	4.49	3.06	314.	13.82	2.16	119.
UMATILLA/ LWR JOHN DAY	2.75	1.42	207.	14.67	1.57	112.
UPR DESCHUTES/ CROOKED	5.41	4.47	575.	16.31	4.18	134.
HOOD/ LOWER DESCHUTES	4.44	3.00	309.	26.06	.86	103.
NW SLOPE WASH CASCADES	4.24	-.25	94.	69.33	-5.86	92.
SW WA CASCADES/COWLITZ	5.07	1.58	145.	60.51	-.91	99.
WILLAMETTE VALLEY	6.79	3.67	217.	53.90	1.25	102.
ROGUE/ UMPQUA	5.51	3.82	326.	40.67	8.16	125.
KLAMATH BASIN	3.83	2.84	387.	20.38	4.81	131.
LAKE COUNTY-GOOSE LAKE	4.43	3.22	367.	13.36	3.33	133.
HARNEY/ MALHEUR BASIN	3.74	2.62	334.	13.62	4.29	146.

DIVISION VALUES ARE COMPUTED BY UTILIZING UN-WEIGHTED PRECIPITATION AMOUNTS FROM KEY STATIONS IN EACH AREA. NORMALS BASED ON 1961-1990. FOR FURTHER INFORMATION CONTACT: NWRFC (503) 326-7291.

NORTHWEST RIVER FORECAST CENTER - PORTLAND, OREGON
COLUMBIA BASIN PRECIPITATION (MONTHLY SUMMARY)
May 1998 Weather Summary

EXCESSIVE WIDESPREAD PRECIPITATION CHARACTERIZED MAY. THIS MONTH RANKED AS THE WETTEST FOR PORTLAND, SECOND PLACE FOR SALEM AND MEDFORD, THIRD PLACE FOR EUGENE, FIFTH PLACE FOR KALISPELL, AND ELEVENTH PLACE FOR MISSOULA. MANY SITES REPORTED 200 - 780 PERCENT OF NORMAL PRECIPITATION!! FLOODING OCCURRED BY LATE MONTH.

MEAN TEMPERATURES DEPARTED +0.9°F (31 STATIONS) FROM NORMAL FOR THE PACIFIC NORTHWEST RELATIVE TO 1961-1990 NORMALS. MEAN TEMPERATURE DEPARTURES RANGED BETWEEN 7.5 AND -3.5°F. RECORD HIGHS WARMED PORTLAND ON THE 1ST (85°F) AND KALISPELL ON THE 2ND (80 DEGREES). RECORD PRECIPITATION SOAKED PORTLAND ON THE 20TH (0.68") AND 24TH (0.87 INCH); SALEM ON THE 29TH (0.59"); MISSOULA ON THE 26TH (0.99"); HELENA ON THE 27TH (0.56"); KALISPELL ON THE 26TH (0.90") AND 27TH (0.68"); AND GREAT FALLS ON THE 30TH (1.88"). BY THE 31ST, THE REGIONAL SNOW DEPTHS (IN INCHES) WERE: CRATER LAKE NP, OR, 92 AND MT. RAINIER-PARADISE RS, WA, 112.

THE THERMAL LOW OF LATE APRIL WAS SLOWLY PUSHED EASTWARD AND REPLACED BY COOLER ALEUTIAN AIR WITH NORTHWESTLY FLOW BY THE 3RD. A BLOCKING RIDGE RETURNED FOR A WEEK. BY THE 12TH, AN EXTENDED TROUGH FROM ALASKA ANCHORED ITSELF OFF OREGON AND HELP GUIDE FRONT AFTER FRONT FOR THE REST OF THE MONTH. FREEZING LINES DROPPED TO 3500 FEET IN SOUTHWEST OREGON BY THE MEMORIAL DAY WEEKEND, WITH NEW SNOW REPORTED IN THE OREGON COASTAL RANGE. TWO STRONG "WRAP-AROUND" LOWS SET UP BY LATE MONTH, CENTERED OVER IDAHO, AND TAPPED INTO ABUNDANT GULF OF MEXICO AIR FROM THE PLAINS TO DELIVER TORRENTIAL RAINS OVER THE MIDDLE SNAKE AND KOOTENAI DRAINAGES. FLOODING OCCURRED ON THE PAYETTE, WEISER, BOISE, IMNAHA, AND PORTNEUF DRAINAGES. THE SNAKE AT WEISER SAW MAJOR FLOODING. FUNNEL CLOUDS WERE NOTED NEAR BOISE ON THE 27TH AND NEAR CLATSKANIE ON THE 25TH.

FOR MAY...PRECIPITATION WAS 176 PERCENT OF NORMAL (1961-1990) AT COLUMBIA ABOVE COULEE; 235 PERCENT OF NORMAL AT THE SNAKE RIVER ABOVE ICE HARBOR; AND 201 PERCENT AT COLUMBIA ABOVE THE DALLES.

end/nwrfc/kmartin

SEASONAL
WATER SUPPLY FORECASTS
ISSUED BY
NATIONAL WEATHER SERVICE
NORTHWEST RIVER FORECAST CENTER
PORTLAND OREGON

JUN-98EARLY 1 WATER SUPPLY FORECASTS
OBS PREC THRU 25TH; NORMAL REST OF PERIOD; EST RUNOFF

<u>STREAM AND STATION</u>	<u>PERIOD</u>	<u>FORECAST</u>	<u>%</u>	<u>AVERAGE</u>
COLUMBIA RIVER				
MICA RESERVOIR INFLOW, BC	FEB-SEP	11700.0	89	13170.
	APR-SEP	11200.0	88	12730.
ARROW LAKES INFLOW	FEB-SEP	23200.0	87	26800.
	APR-SEP	21800.0	85	25540.
BIRCHBANK, BC (1)	APR-SEP	38300.0	87	43800.
GRAND COULEE, WA (1)	JAN-JUL	55600.0	88	63280.
	APR-SEP	55900.0	86	64850.
ROCK ISLAND DAM BLO, WA (1)	APR-SEP	61600.0	87	70480.
THE DALLES NR, OR (1)	APR-SEP	89000.0	90	98980.
	JAN-JUL	97000.0	92	105900.
KOOTENAI RIVER				
LIBBY RES INFLOW, MT (1)	APR-SEP	5940.0	88	6772.
KOOTENAY RIVER				
KOOTENAY LAKE INFLOW, BC	APR-SEP	14700.0	88	16650.
DUNCAN RIVER				
DUNCAN RESERVOIR INFLOW, BC	FEB-SEP	2180.0	94	2319.
	APR-SEP	2090.0	93	2238.
CLARK FORK				
ST. REGIS, MT (1)	APR-SEP	3040.0	74	4095.
PEND OREILLE RIVER				
PEND OREILLE LAKE IN, ID (1)	APR-SEP	10300.0	72	14370.
S.F. FLATHEAD RIVER				
HUNGRY HORSE RES IN, MT (1)	APR-SEP	1580.0	72	2184.
FLATHEAD RIVER				
FLATHEAD LAKE INFLOW, MT (1)	APR-SEP	5060.0	73	6926.
COEUR D'ALENE RIVER				
COEUR D'ALENE LAKE IN, ID	APR-SEP	1860.0	68	2720.
SIMILKAMEEN RIVER				
NIGHTHAWK NR, WA (1)	APR-JUL	990.0	76	1304.
OKANAGAN RIVER				
TONASKET NR, WA (1)	APR-SEP	1280.0	79	1623.
CHELAN RIVER				
LAKE CHELAN INFLOW, WA (1)	APR-SEP	1160.0	100	1160.
YAKIMA RIVER				
PARKER NR, WA	APR-SEP	1810.0	91	1994.
SKAGIT RIVER				
CONCRETE NR, WA	APR-SEP	5640.0	86	6525.
COWLITZ RIVER				
MAYFIELD RES INFLOW, WA	APR-SEP	1790.0	91	1971.
	APR-JUL	1570.0	91	1731.
CASTLE ROCK, WA	APR-SEP	2430.0	91	2668.
SNAKE RIVER				
JACKSON LAKE INFLOW, WY (1)	APR-JUL	780.0	100	781.
PALISADES RES INFLOW, ID (1)	APR-JUL	3190.0	99	3226.
HEISE NR, ID	APR-JUL	3380.0	98	3451.
WEISER, ID (1)	APR-JUL	5950.0	109	5465.
BROWNLEE RES INFLOW	APR-JUL	6560.0	113	5794.
LOWER GRANITE RES IN, WA (1)	JAN-JUL	30100.0	101	29740.
	APR-JUL	22400.0	103	21650.

<u>STREAM AND STATION</u>	<u>PERIOD</u>	<u>FORECAST</u>	<u>%</u>	<u>AVERAGE</u>
TETON RIVER				
ST. ANTHONY NR, ID	APR-JUL	400.0	105	380.
HENRYS FORK				
REXBURG NR, ID	APR-JUL	1220.0	100	1219.
PORTNEUF RIVER				
TOPAZ, ID	APR-SEP	102.0	110	93.
BIG LOST RIVER				
MACKAY RESERVOIR INFLOW, ID	APR-JUL	170.0	113	150.
BIG WOOD RIVER				
HAILEY, ID (1)	APR-JUL	250.0	98	254.
MAGIC RESERVOIR INFLOW, ID	APR-JUL	285.0	97	295.
LITTLE WOOD RIVER				
CAREY NR, ID	APR-JUL	99.0	108	92.
OWYHEE RIVER				
OWYHEE RES INFLOW, OR	MAR-JUL	655.0	116	567.
BOISE RIVER				
BOISE NR, ID (1)	APR-JUL	1460.0	103	1421.
MALHEUR RIVER				
DREWSEY NR, OR	MAR-JUL	140.0	136	103.
N.F. MALHEUR RIVER				
BEULAH RES INFLOW, OR (1)	MAR-JUL	93.0	122	76.
PAYETTE RIVER				
HORSESHOE BEND NR, ID (1)	APR-JUL	1740.0	108	1618.
WEISER RIVER				
WEISER NR, ID (1)	APR-JUL	450.0	117	386.
POWDER RIVER				
SUMPTER NR, OR	MAR-JUL	71.0	106	67.
SALMON RIVER				
WHITEBIRD, ID (1)	APR-JUL	6100.0	102	5956.
GRANDE RONDE RIVER				
LA GRANDE, OR	MAR-JUL	220.0	101	218.
TROY, OR (1)	MAR-JUL	1550.0	105	1471.
CLEARWATER RIVER				
OROFINO, ID (1)	APR-JUL	3770.0	80	4718.
N.F. CLEARWATER RIVER				
DWORSHAK RES INFLOW, ID (1)	APR-JUL	2010.0	74	2700.
	APR-SEP	2140.0	74	2874.
CLEARWATER RIVER				
SPALDING, ID (1)	APR-JUL	6170.0	81	7618.
	APR-SEP	6530.0	81	8052.
UMATILLA RIVER				
GIBBON NR, OR	APR-JUL	69.0	99	70.
PENDLETON, OR	APR-JUL	132.0	94	141.
S.F. WALLA WALLA RIVER				
MILTON NR, OR	APR-JUL	54.0	102	53.
M.F. JOHN DAY RIVER				
RITTER, OR (1)	APR-JUL	129.0	111	116.
N.F. JOHN DAY RIVER				
MONUMENT NR, OR	APR-JUL	810.0	143	567.
JOHN DAY RIVER				
SERVICE CREEK, OR (1)	APR-SEP	980.0	119	821.
DESCHUTES RIVER				
BENHAM FALLS, OR	APR-SEP	595.0	112	529.
CROOKED RIVER				
PRINEVILLE RES INFLOW, OR	MAR-JUL	215.0	126	171.

<u>STREAM AND STATION</u>	<u>PERIOD</u>	<u>FORECAST</u>	<u>%</u>	<u>AVERAGE</u>
OCHOCO CREEK				
OCHOCO RES INFLOW, OR	MAR-JUL	40.0	121	33.
S. SANTIAM RIVER				
WATERLOO, OR	APR-SEP	470.0	82	576.
N. SANTIAM RIVER				
MEHAMA, OR	APR-SEP	725.0	87	832.
WILLAMETTE RIVER				
SALEM, OR	APR-SEP	4160.0	89	4670.
CLACKAMAS RIVER				
ESTACADA, OR	APR-SEP	760.0	102	742.
MCKENZIE RIVER				
VIDA NR, OR	APR-SEP	975.0	82	1184.
ROGUE RIVER				
RAYGOLD, OR	APR-SEP	910.0	105	868.
SILVIES RIVER				
BURNS NR, OR	APR-SEP	126.0	140	90.

THESE FORECASTS ARE SELECTED FROM THOSE PREPARED BY: NATIONAL WEATHER SERVICE, NATURAL RESOURCE CONSERVATION SERVICE, AND B.C. HYDRO AND POWER AUTHORITY. FOR VARIOUS PROJECT INFLOWS, THE FORECASTS HAVE BEEN COORDINATED WITH THE COLUMBIA RIVER FORECAST SERVICE AND THE U.S. BUREAU OF RECLAMATION.

ALL FORECASTS ARE IN THOUSANDS OF ACRE-FEET
 ALL AVERAGES ARE FOR THE PERIOD 1961 THROUGH 1990
 END.....NOAA/NWS/NORTHWEST RFC.....

**PEAK FLOW/STAGE FORECAST
NATIONAL WEATHER SERVICE
NW RIVER FORECAST CENTER**

VERIFICATION VALUES				
COLUMBIA BASIN				
<u>STATION</u>	<u>FLOOD STAGE (FEET)</u>	<u>OBSERVED STAGE (FEET)</u>	<u>OBSERVED FLOW (KCFS)</u>	<u>DATE</u> _____
COLUMBIA RIVER				
PRIEST RAPIDS - WASH.	32.0		315.0	6/02
THE DALLES			440.0	5/30
VANCOUVER	16.0	14.9		6/01
WILLAMETTE RIVER				
PORTLAND - OREGON	18.0	14.8		6/01
CLARK FORK				
MISSOULA (ABOVE) - MT.	11.0	6.6	8.20	5/28
ST. REGIS - MT.	19.0	12.4	23.40	5/28
FLATHEAD RIVER				
COLUMBIA FALLS - MT.	14.0	10.3	27.50	5/28
PEND OREILLE RIVER				
NEWPORT - WASHINGTON	100KCFS		66.50	5/29
SPOKANE RIVER				
SPOKANE - WA.	27.0	23.8	16.40	5/31
OKANOGAN RIVER				
TONASKET - WA.	15.0	13.9	16.30	5/08
WENATCHEE RIVER				
PESHASTIN - WA.	13.0	10.4	15.90	5/06
YAKIMA RIVER				
PARKER (NR) - WA.	10.0	8.4	13.90	5/07
SNAKE RIVER				
LOWER GRANITE - WA.			213.0	5/27
HENRYS FORK				
REXBURG - ID.	9.0	9.8	8.7	5/12
PAYETTE RIVER				
EMMETT - ID.	16KCFS	10.9	17.4	5/27
SALMON RIVER				
WHITEBIRD - ID.	32.0	25.0	49.3	5/09
CLEARWATER RIVER				
SPALDING - ID.	18.0	12.6	56.4	5/23

PEAK FORECASTS PREDICT THE RANGE OF THE 67% CHANCE (1-SIGMA ABOUT THE MEDIAN) OF OCCURRENCE. ABNORMAL WEATHER DURING THE CRITICAL MELT PERIOD, SUCH AS THE STORMS OVER IDAHO IN LATE MAY, COULD CAUSE THE PEAK TO BE OUTSIDE THE INDICATED RANGE.

end/nwrfc/km

Fact Sheet for Ochoco and Prineville Reservoirs
Flood Event: 31 May-1 June 1998

Ochoco Reservoir

Active capacity: 44,247 af
Full pool elev: 3130.7 ft
Maximum storage during event: 46,525 af
Maximum pool elev. during event: 3132.8 ft
Peak inflow during event: 2,550 cfs
Peak discharge during event: 2,050 cfs

Ochoco Reservoir reduced flood peak by 500 cfs.

Prineville Reservoir

Active capacity: 152,800 af
Full pool elev: 3234.8 ft
Maximum storage during event: 173,200 af
Maximum pool elev. during event: 3241.3 ft
Peak inflow during event: 6,630 cfs
Peak discharge during event: 1,525 cfs

Prineville Reservoir reduced flood peak by 5,105 cfs.

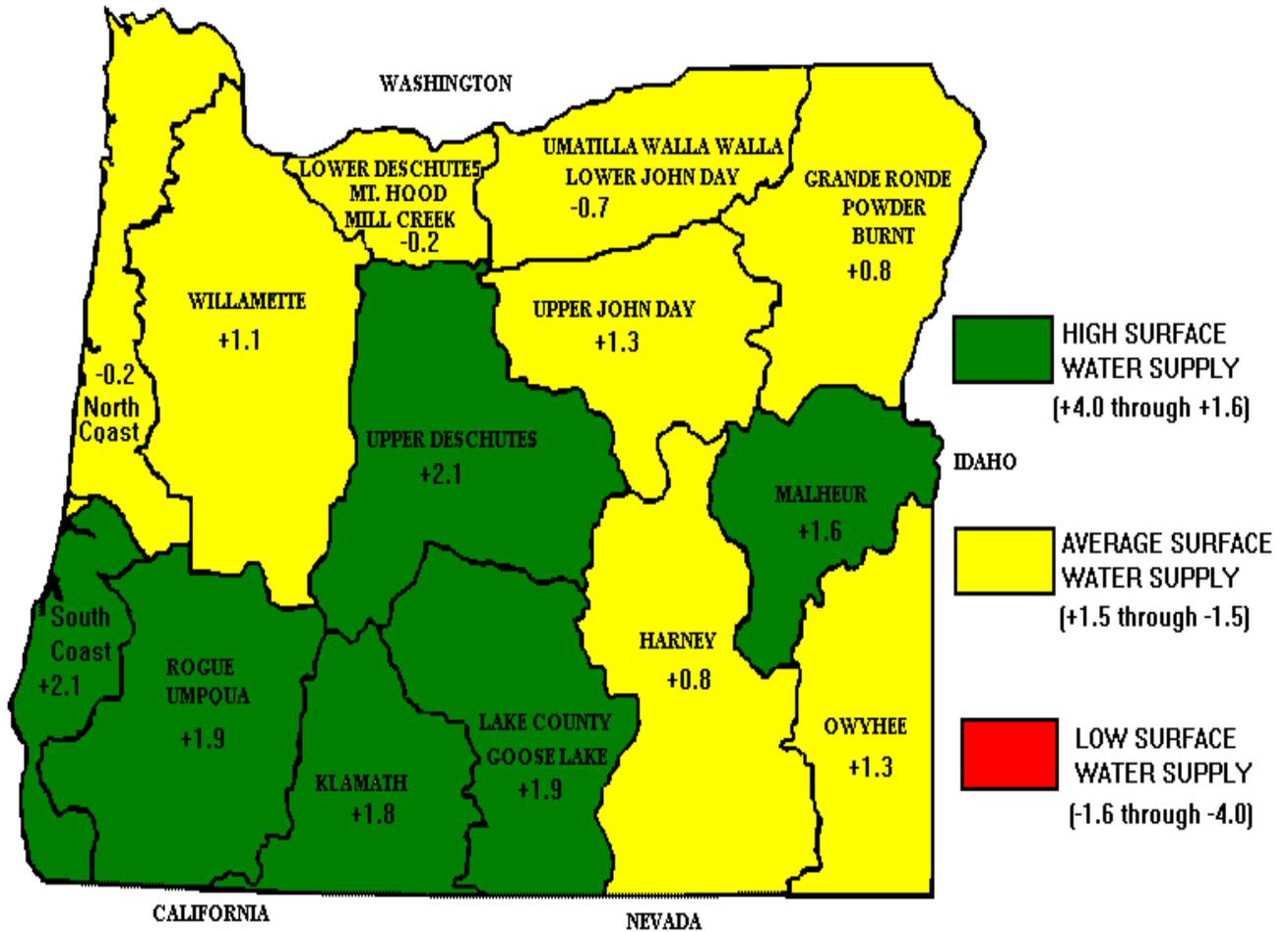
Operational Notes

Both reservoirs were operated according to their Rule Curve requirements. Ochoco was allowed to fill on May 5, and Prineville was filled on April 19 (although it was allowed to fill as early as April 1 based on this year's runoff forecasts.) Both projects were passing a minor amount of water over their spillways prior to the rain event. All snowpack in the basin was essentially melted out by mid-May and inflows were in recession. Irrigation demand was low and the projects were not yet being drafted to meet demand, as would usually be the case by late May. This flood was caused by an intense basin wide rain event lasting approximately 28 hours. Rainfall amounts were very uniform over the basin and typically ranged from 2 to 3 inches. This is approximately 25% of the annual rainfall at Prineville, Oregon. It also appears from initial investigation that this will set a new record for 1 day precipitation. The largest rain events in the basin have typically occurred in the winter months; a rain event of near this magnitude is unprecedented for late May.

SURFACE WATER SUPPLY INDEX

(SWSI)

June 1, 1998



US GEOLOGICAL SURVEY, WATER RESOURCES DIVISION
Oregon District
COMPARATIVE FLOW TABLE FOR MAY, 1998

Station	----- Monthly mean discharge ----- Cubic Percent feet per of second average		Change in dis- charge from previous month (percent)	----- Discharge near end of month ----- Cubic feet per second	----- Date	----- Accumulated Runoff ----- Oct-May Percent of Average
John Day River at Service Creek, OR	7,211	146	+55	10,700	31	102
Wilson River nr Tillamook, OR	427	73	-24	400	31	112
Umpqua River nr Elkton, OR	12,610	206	+65	26,120	31	97
Columbia River at The Dalles, OR	551,600(a)	133	+147	425,000	31	118
Willamette River at Salem, OR	24,900(a)	116	+8	47,900	31	94
Chehalis River nr Grand Mound, WA	1,211	89	-31	1,360	31	113
Skykomish River nr Gold Bar, WA	7,040	109	+99	5,400	31	107
Spokane River at Spokane, WA	13,303(a)	76	+21	7,740	31	87
Snake River at Heise, ID	20,400(a)	120	+196	25,500	31	119
Snake River at Weiser, ID	47,500	176	+61	65,900	31	120
Salmon River at White Bird, ID	36,500	118	+233	36,300	31	110
Clearwater River at Spalding, ID	46,700	102	+112	38,800	31	95
Clark Fork at St. Regis, MT	18,450	91	+151	19,500	31	89
MF Flathead River nr West Glacier, MT	8,700	93	+173	8,690	31	94

Percent of Average computed using 30-year base period, Water Years 1961-90
(a) adjusted for upstream storage

06/04/98

Enc 4

DWORSHAK APRIL-JULY INFLOW FORECAST

Run Date is 1 JUN 1998

1NOV 1DEC 1JAN 1FEB 1MAR 1APR 1MAY 1JUN

ELBI ELK BUTTE .2 5.2 9.8 20.5 25.3 27.0 19.6 0.0
 HEMI HEMLOCK .3 6.8 13.0 23.9 28.5 32.0 28.3 3.6
 HOOM HOODOO BASIN .3 7.8 12.3 23.6 27.3 31.4 31.5 17.3
 PIRI PIERCE RG S 3.2 6.0 6.0
 SHAI SHANGHI SUM .2 4.9 9.4 18.1 21.8 20.8 9.8
 LSLI LOST LAKE 4.3 10.3 15.5 29.0 33.9 17.2
 EKRI ELK RIVER 1S 3.4
 DWR AVERAGE KAF 137 193 171 223 370 510
 ASOI July-Aug SOI -3 -3 -3 -3 -3 -3
 SSOI July-Sep SOI -5 -5 -5 -5 -5 -5
 OSOI July-Oct SOI -6 -6 -6 -6 -6 -6
 NSOI July-Nov SOI -8 -8 -8 -8 -8 -8
 DSOI July-Dec SOI -9 -9 -9 -9
 DWORSHAK FC SPACE 700 730 600 200
 DWORSHAK FC ELEV 1558 1556 1565 1589
 DWORSHAK FOM ELEV 1500 1500 1505 1513 1524 1545 1562 1600

ELBI = ELK BUTTE ACCUMULATED SWE IN INCHES (SNOTEL) elev 5550 FT
 HEMI = HEMLOCK ACCUMULATED SWE IN INCHES (SNOTEL) elev 5810 FT
 HOOM = HOODOO BASIN ACCUMULATED SWE IN INCHES (SNOTEL) elev 6050 FT
 PIRI = PIERCE RANGER STATION ACCUMULATED SWE IN INCHES (snow course)
 LSLI = LOST LAKE ACCUMULATED SWE IN INCHES (SNOTEL) elev 6110 FT
 EKRI = ELK RIVER 1S ACCUMULATED MONTHLY PRECIP IN INCHES elev 2910 FT
 DWRI = MONTHLY DWORSHAK INFLOW (KAF)
 JD = JANUARY DWORSHAK INFLOW (KAF)
 FD = FEBRUARY DWORSHAK INFLOW (KAF)
 MD = MARCH DWORSHAK INFLOW (KAF)
 AD = APRIL DWORSHAK INFLOW (KAF)

FORECAST EQUATIONS:

01OCT=276.4*ASOI+2690
 01NOV=191.5*SSOI+2667
 01DEC=144.2*OSOI+2687
 01JAN=12.7*ELBI+15.3*HEMI+13.3*HOOM+63.3*PIRI+89.7*NSOI+17.1*EKRI+1539
 01FEB=18.6*ELBI+15.6*HEMI+18.5*HOOM+44.1*PIRI+20.3*DSOI+.8*JD+540
 01MAR=14.2*ELBI+14.7*HEMI+15.5*HOOM+33.4*PIRI+21.8*DSOI+.9*JD+.2*FD+369
 01APR=15.1*ELBI+15.4*HEMI+14.6*HOOM+15.9*SHAI+22.6*DSOI+.8*JD+.3*FD+.3*MD-168
 01MAY=14.1*ELBI+12.3*HEMI+12.6*HOOM+13.9*SHAI+.3*AD-201
 01JUN=8.2*ELBI+7.3*HEMI+8.4*HOOM+5.7*LSLI+183

April-July Average inflow 2700 KAF

% Chance that OBSERVED will be > than given value

1% 5% 20% 50% 80% 95% 99%

01Oct April-July Forecast 1833 KAF 3539 3034 2448 1833 1218 632 127
 01Nov April-July Forecast 1786 KAF 3412 2931 2372 1786 1200 641 160
 01Dec April-July Forecast 1764 KAF 3419 2929 2361 1764 1167 599 109
 01Jan April-July Forecast 1587 KAF 2907 2516 2063 1587 1111 658 267
 01Feb April-July Forecast 1943 KAF 2926 2635 2297 1943 1589 1251 960
 01Mar April-July Forecast 1765 KAF 2593 2348 2063 1765 1467 1182 937
 01Apr April-July Forecast 1633 KAF 2275 2085 1864 1633 1402 1181 991
 01May April-July Forecast 1620 KAF 2223 2044 1837 1620 1402 1195 1016
 01Jun April-July Forecast 1931 KAF 2267 2168 2052 1931 1809 1694 1594

The given forecast values are to be considered the Corps of Engineers Official Forecast for Dworshak. If you have questions on this report, contact:

Jim.D.Versteeg@nwd01.npd.usace.army.mil

Date: 21:15:50 UT on Thu 25 Jun 98.

WATER CONDITIONS REPORT - PN REGION
RESERVOIR STORAGE - May, 1998
End of Month Reservoir Contents (1000 AF):

STATION - CODE	ACTIVE CAPACITY	MAY			
		1998	% OF CAPACITY	AVG	% OF AVG
HGH-AF-HUNGRY HORSE DAM & R	2981.20	2789.88H	94	2212.64	126
CMO-AF-COMO DAM AND LAKE ON	35.10	39.24I	112	28.82	136
<u>Yakima River Basin</u>					
CLE-AF-CLE ELUM LAKE, WA	436.90	437.000	100	367.20R	119
KAC-AF-KACHESS LAKE, WA	239.00	238.890	100	216.90	110
KEE-AF-KEECHELUS LAKE, WA	157.80	157.470	100	139.40	113
RIM-AF-TIETON DAM & RIMROCK	198.00	198.850	100	159.90	124
BUM-AF-BUMPING LAKE, WA	33.70	35.380	105	25.40R	139
<u>Columbia Basin</u>					
GCL-AF-GRAND COULEE DAM & F	5185.45	4789.400	92	2577.80	186
BNK-AF-BANKS LAKE NR GRAND	715.00	711.700	100	502.32	142
POT-AF-O'SULLIVAN DAM & POT	332.20	220.200	66	228.77	96
<u>Okanogan River Basin</u>					
CCR-AF-CONCONULLY DAM & RES	13.00	13.38I	103	10.15	132
CCL-AF-SALMON LK DAM & CONC	10.50	10.04I	96	9.57	105
<u>Snake River Basin</u>					
JCK-AF-JACKSON LAKE NEAR MO	847.00	757.73V	89	540.81	140
PAL-AF-PALISADES RESERVOIR	1200.00	921.10V	77	855.09	108
ISL-AF-ISLAND PARK RESERVOIR	135.20	134.88V	100	134.01	101
GRS-AF-GRASSY LAKE NR MORAN	15.20	14.87V	98	13.63	109
RIR-AF-RIRIE RESERVOIR NEAR	80.50	80.09V	99	68.36E	117
AMF-AF-AMERICAN FALLS RES A	1672.60	1654.58V	99	1501.43	110
MIN-AF-MINIDOKA DAM & LAKE	95.20	92.39V	97	96.03	96
WOD-AF-LITTLE WOOD RESERVOIR	30.00	30.08V	100	27.82	108
<u>Boise River Basin</u>					
AND-AF-ANDERSON RANCH RES A	423.20	423.04V	100	364.64	116
ARK-AF-ARROWROCK RESERVOIR	286.60	287.72V	100	203.12	142
LUC-AF-LUCKY PEAK LAKE NEAR	264.40	258.10V	98	203.32	127
LOW-AF-LAKE LOWELL, ID	169.10	150.01V	89	141.12	106
<u>Payette River Basin</u>					
CSC-AF-CASCADE RESERVOIR AT	653.00	650.55V	100	511.28	127
DED-AF-DEADWOOD RESERVOIR N	161.90	162.57V	100	137.72	118
<u>Weiser River Basin</u>					
MAN-AF-MANN CR DAM & RES ON	11.10	11.08V	100	10.38E	107
<u>Clearwater River Basin</u>					
RES-AF-LEWISTON ORCHARDS RE	3.00	1.84V	61	3.10E	59
SOL-AF-SOLDIERS MEADOW DAM,	2.37	2.25E	95	1.90E	119
<u>Owyhee River Basin</u>					
OWY-AF-LAKE OWYHEE NEAR NYS	715.00	724.73V	101	598.47	121
WLD-AF-WILDHORSE RESERVOIR	71.50	74.24V	104	49.34	150

Continued--End of Month Reservoir Contents (1000 AF):

STATION - CODE	ACTIVE CAPACITY	MAY			
		1998	% OF CAPACITY	AVG	% OF AVG
<u>Malheur River Basin</u>					
BEU-AF-AGENCY VALLEY DAM &	59.90	59.74V	100	48.35	124
BUL-AF-BULLY CREEK RESERVOI	30.00	30.95V	103	22.61E	137
WAR-AF-WARM SPRINGS RESERVO	191.00	190.98V	100	141.29	135
<u>Powder River Basin</u>					
PHL-AF-MASON DAM & PHILLIPS	73.50	81.09V	110	62.84E	129
THF-AF-THIEF VALLEY RESERVO	17.40	14.26V	82	16.97E	84
<u>Burnt River Basin</u>					
UNY-AF-UNITY RESERVOIR NEAR	25.20	24.62V	98	22.77	108
<u>Umatilla River Basin</u>					
MCK-AF-MCKAY RESERVOIR NR P	66.26	65.54V	99	59.87	109
CLS-AF-COLD SPRINGS DAM & R	38.33	23.34V	61	44.55	52
<u>Deschutes River Basin</u>					
CRA-AF-CRANE PRAIRIE DAM &	55.30	52.74I	95	40.33	131
CRE-AF-CRESCENT LK DAM & LK	86.90	81.11V	93	59.28	137
WIC-AF-WICKIUP DAM & RES ON	200.00	194.74I	97	165.89	117
OCH-AF-OCHOCO DAM & RES ON	45.24	45.92V	102	38.34	120
PRV-AF-ARTHUR R BOWMAN DAM	152.80	171.90V	113	144.94	119
HAY-AF-HAYSTACK DAM & RES O	5.64	5.19I	92	4.57E	114
WAS-AF-WASCO DAM & CLEAR LA	11.90	7.27V	61	7.90	92
<u>Rogue River Basin</u>					
AGA-AF-AGATE DAM AND RES ON	4.70	4.65I	99	4.49E	103
EMI-AF-EMIGRANT DAM & LK ON	39.00	38.87V	100	35.32	110
FIS-AF-FISH LK NR LAKE CR,	7.90	8.07I	102	6.47E	125
FOR-AF-FOURMILE LAKE, OR	15.60	16.66I	107	11.71E	142
HPD-AF-HOWARD PRAIRIE DAM &	60.60	63.02V	104	53.86E	117
HYA-AF-HYATT DAM & RES NR A	16.00	16.42V	103	14.25E	115
<u>Tualatin River Basin</u>					
SCO-AF-SCOGGINS DAM AND HEN	53.60	53.53I	100	52.03E	103
TOTAL OF 53 RESERVOIRS	18431.48	17323.87	94	12999.07	133

AF is acre-feet.

AVG is published 30-year average, 1961-1990.

Please note that all data are PROVISIONAL and subject to revision.

This report is updated monthly, after the 15th of each month.

CORPS OF ENGINEERS, NORTH PACIFIC DIVISION
REPORT FOR JUNE 1998 CRWGM MEETING

Libby.

The reservoir began May at elevation 2399.6 ft. The average outflows for the month of April were 10.1 kcfs. The elevation at the end of May was 2440.2 ft. The project released full powerhouse capacity (21.6 kcfs) between 19 and 21 May. This was in response to a USFWS request for a sturgeon pulse when Bonners Ferry water temperature increased to about 10°C at Bonners Ferry and sturgeon movement increased. Inflows in the month of May averaged 34.6 kcfs, 130 percent of normal. The June final volume forecast for April – August is 6.2 MAF, which is 97 % of normal. Peak spring inflow was 64 kcfs on 28 May. On 8 June inflows had dropped to 27 kcfs.

Albeni Falls.

The project is currently full and operating between 2062' and 2062.5'. The project filled on May 29 and reached a peak of 2062.63' at Hope on May 31 due to heavy amounts of precipitation. Outflows were increased to 66 kcfs and the lake drafted below full by June 2. The average outflows in May were 35.7 kcfs. The unregulated inflow to Lake Pend Oreille in May was 72.3kcfs, 96% of normal. The June final volume forecast for April – August is 10.7 MAF, 81% of normal. Peak regulated spring inflow was 75 kcfs on 28 May. By 8 June regulated inflows had dropped to 45 kcfs.

Dworshak.

Dworshak elevation reached 1500 ft at the end of August 1997 and remained at this elevation through 1 December to facilitate grouting work to slow down seepage through the dam. Outflows were at minimum flow (1.3 kcfs) 1 December - 19 April to fill the project as much as possible. The Salmon Managers requested flow augmentation water for Lower Granite and flows were increased to full load (9.9 kcfs, 450 MW) on 19 April. Full load continued through 30 April until the natural inflows to Lower Granite increased dramatically. Project outflows were reduced to minimum (1.3 kcfs) on 2 May and were increased on 19 May to slow down the project fill. The project reached full (1600.0 ft) on 4 June. The project is currently passing inflow. Lower Granite inflows have exceeded 100 kcfs since 3 May (so far through today, 9 June). The project expects to fill again before the end of June and be available to augment Lower Granite flows when needed – until project elevation 1520' is reached. Actual elevation at the beginning and end of May was 1561.9 ft and 1599.64 ft. Inflow in May was 5.4 kcfs, 94% of normal. The June final volume forecast for April – July was 1.93 MAF (an increase of 0.31 MAF from any final volume forecast), 71% of normal. Peak spring inflow was 19 kcfs on 22 May. By 8 June inflows had dropped to 8 kcfs.

Lower Snake Projects.

Lower Granite May inflows were 152 kcfs, 129% of normal. Lower Granite, Little Goose, and Lower Monumental and Ice Harbor dams were drafted to Minimum Operating Pool (MOP) between 6 and 9 April, and are operating between MOP and MOP + 1' (733' – 734', 633' – 634', and 537' – 538'). Ice Harbor was drafted at that same time and is operating between MOP + 1' and MOP + 2' (438' – 439') because there is a high spot in the navigation channel below Lower Monumental Dam that prevents a 14' channel when the project is at MOP. Voluntary spilling started on all Lower Snake projects the evening of 6 April. Unregulated inflow in May was 152 kcfs, 129% of normal. The June final volume forecast (April – July) for Lower Granite was 22.3 MAF (an increase of 4.9 MAF from May final volume forecast), 103% of normal. The peak regulated spring inflow was 213 kcfs on 27 May. On 8 May it had fallen to 127 kcfs.

Willamette Basin Projects.

All of the Willamette projects are now at maximum conservation pool and passing inflow. The Willamette Basin snowpack has decreased to 68% of normal, while May precipitation was about 179% of normal. Precipitation since October 1 has risen to 99% of normal in the Valley. Fern Ridge, Detroit, Hills Creek and Foster should remain near full for the majority of the summer. Lookout Point and Cougar will be drafted early to augment flows in the lower river. Fall Creek, and Blue River may be drawn down in July for special operations. Fall Creek is scheduled for stilling basin repair in August and September. Cottage Grove, Dorena, and Green Peter may be drawn down slightly due to minimum flow restrictions.

FISHERY REPORT - COLUMBIA RIVER WATER MANAGEMENT GROUP June 1998**FLOWS:**

Flow targets required by Biological Opinion are: 228 kcfs at McNary and 90 kcfs at Lower Granite. At both sites the average weekly flows were higher than minimum required flows by BiOp during May through the first week of June period. The weekly averages at Lower Granite were in the range of 93,187 kcfs and at McNary were in the range of 228,375 kcfs.

SPILL:

Lower Snake: Daily spill average at Lower Granite was in the range of 31-32 kcfs during the first three weeks of May. Peaking flows during the last week of May and the first week of June were in excess of hydraulic capacity of the powerhouses, resulting in spilling in the range of 70-100 kcfs. Lower Monumental and Little Goose dams were spilling up to the dissolved gas waiver limits, and only from 6 pm to 6 am, until the flows increased so high that it was necessary to spill during all 24 hours. Spilling at Ice Harbor was provided at 24 hours basis during May.

Lower Columbia: Spill in the lower Columbia was initiated on April 20. Spill was requested from 6 pm to 6 am at McNary and John Day dams and for 24 hours at The Dalles and Bonneville dams, at the amounts of 115/120% TDG, the gas limit consistent with a system wide approach to passage management. High flows resulted in 24-hour spilling at all four dams. The spill was gradually increasing during May-June in the range of 130 kcfs to 229.6 kcfs at McNary Dam 105.6-164.4 kcfs at John Day, 129-236.3 kcs at The Dalles, and from 92-204 kcfs at Bonneville. At such high flow levels it was difficult for the Corps of Engineers to maintain daily spill levels at 75 kcfs at Bonneville (this is important because at higher spill levels significant adult fallback occurs).

TOTAL DISSOLVED GAS SUPER-SATURATION AND GAS BUBBLE TRAUMA MONITORING:

Lower Snake: During first three weeks of May total dissolved gas levels were managed to the gas waiver levels below Little Goose and Lower Monumental dams, and below the waiver levels at the other lower Snake projects. During the last week of May and the first week of June as expected total dissolved gas levels exceeded the water quality waiver levels at all the lower Snake projects due to the spill in excess of powerhouse hydraulic capacity. During peak flows TDG concentrations exceeded 130% at all projects. Currently, as the flows are in recession, the TDG concentration levels are decreasing also.

Middle Snake: The Hells Canyon project has been passing inflow during May 21-June 9 in the range of 50-80 kcfs. The hydraulic capacity of the powerhousse is only 30 kcfs and consequently significant amounts of spill has been occurring. No data on TDG levels has been released and, therefore, it is difficult to assess the impact of this project operation on the rearing subyearling fall chinook in the river reach below the project.

Lower Columbia: Total dissolved gas levels at all projects were managed below gas waivers during first three weeks of May. TDG levels increased during last week of May and first week of June above the gas waivers due to a combination of a lack of powerhouse hydraulic capacity and resultant spill.

Gas Bubble Trauma (GBT) monitoring has occurred at all sites during May 1 -June 9. Few fish were showing signs throughout the system, but with the percentage well below the action criteria. Some juvenile fish were showing the signs of GBT during last week of May and first week of June, with the percentage of signs exceeding the action criteria at Little Goose and Ice Harbor. However, the management action could be taken, since the spill levels were not a result of the BiOp spill program, but were due to flows in excess of hydraulic capacity.

SMOLT MONITORING:

Average fish passage indices are given in the following table for the major sites and for biweekly periods:

YEARLING CHINOOK

<u>Period</u>	<u>LGR</u>	<u>LGS</u>	<u>LMN</u>	<u>RIS</u>	<u>MCN</u>	<u>JDA</u>	<u>BONI</u>
5/28-6/4	1722	2734	2235				
5/15-5/28	4759	9190	5569				
5/8-5/21	19559	23920	14771				
5/1-5/15	57158	40252	20705				

HATCHERY/WILD COMBINED

<u>Period</u>	<u>LGR</u>	<u>LGS</u>	<u>LMN</u>	<u>RIS</u>	<u>MCN</u>	<u>JDA</u>	<u>BONI</u>
5/28-6/4				555	15907	24123	2750
5/15-5/28				614	27758	26343	4581
5/8-5/21				653	40055	32619	7369
5/1-5/15				531	15317	26494	10376

COMBINED SUBYEARLING CHINOOK

<u>Period</u>	<u>LGR</u>	<u>LGS</u>	<u>LMN</u>	<u>RIS</u>	<u>MCN</u>	<u>JDA</u>	<u>BONI</u>
5/28-6/4				8	34429	3915	18918
5/15-5/28				2	5060	125	15181
5/8-5/21				4	258	110	13454
5/1-5/15				9	1268	117	1423

HATCHERY STEELHEAD

<u>Period</u>	<u>LGR</u>	<u>LGS</u>	<u>LMN</u>	<u>RIS</u>	<u>MCN</u>	<u>JDA</u>	<u>BONI</u>
5/28-6/4	38465	24949	15377	110	5305	11760	5225
5/15-5/28	72736	31449	22534	273	7735	15101	6003
5/8-5/21	117712	53026	40651	530	13834	24209	8241
5/1-5/15	248279	83777	43459	619	14285	18991	6068

WILD STEELHEAD

<u>Period</u>	<u>LGR</u>	<u>LGS</u>	<u>LMN</u>	<u>RIS</u>	<u>MCN</u>	<u>JDA</u>	<u>BONI</u>
5/28-6/4	6495	4544	3064	67	1673	7048	3288
5/15-5/28	9671	5160	3986	92	1680	7283	2724
5/8-5/21	13058	5471	5517	133	2518	12392	3472
5/1-5/15	23134	8488	5967	180	3862	15789	4602

HATCHERY SOCKEYE

<u>Period</u>	<u>LGR</u>	<u>LGS</u>	<u>LMN</u>	<u>RIS</u>	<u>MCN</u>	<u>JDA</u>	<u>BONI</u>
5/28-6/4	669	662	723	52	784	550	170
5/15-5/28	1594	1107	829	176	17536	15320	3292
5/8-5/21	3527	947	568	28	711	595	244
5/1-5/15	2785	370	100	25	1648	885	457

WILD SOCKEYE

<u>Period</u>	<u>LGR</u>	<u>LGS</u>	<u>LMN</u>	<u>RIS</u>	<u>MCN</u>	<u>JDA</u>	<u>BONI</u>
5/28-6/4	11	36	34	67	8121	8810	1655
5/15-5/28	49	37	64	176	17536	15320	3292
5/8-5/21	86	13	36	344	38251	23621	5558
5/1-5/15	42			397	42264	16057	3379

ALL COHO

<u>Period</u>	<u>LGR</u>	<u>LGS</u>	<u>LMN</u>	<u>RIS</u>	<u>MCN</u>	<u>JDA</u>	<u>BONI</u>
5/28-6/4	4182	3063	1716	2259	5034	20357	13526
5/15-5/28	7449	3903	1761	454	5129	22740	10609
5/8-5/21	8230	1890	1112	181	16116	16607	11219
5/1-5/15	6229	599	446	94	6356	8869	11659

ADULT FISH PASSAGE:

At Bonneville Dam, the preliminary adult spring chinook for the 1998 season was 38,253, about 1/3 the 1997 total and half the 10-year average. The summer chinook counting begins on June 1 and appeared very reduced (only 812 through June 4). The early part of the summer chinook run (through mid-June) is normally destined for the Snake River with the Mid-Columbia summer chinook dominating the counts after mid-June. The adult spring Chinook count at McNary Dam was 18,805 through June 4. The Snake River portion of the up-river spring chinook run was 11,427 at Ice Harbor Dam with the Mid-Columbia count at Priest Rapids Dam totaling 3816.

The number of Spring Chinook reported at Rock Island Dam was near 2800 for the season. The steelhead run for the 1998/99 cycle is beginning to pick up at Bonneville Dam, after reducing the numbers with the higher flows during the past week. The highly daily tally was 132 for the week with the count for the cumulative total of 3324.

HATCHERY RELEASES:

Please see attached Summary Report.

TRANSPORTATION:

Please see attached Summary Report.

Transportation Summary Report

Two-Week Transportation Summary from 6/22/98 to 06/04/98

	Yearling	Subyearling	Steelhead	Coho	Sockeye	Total
	Chinook	Chinook				
LOWER GRANITE DAM						
Collected	29,320	2,220	382,840	36,360	5,850	456,590
Bypassed	580	0	4,140	0	0	4,720
Trucked	0	0	0	0	0	0
Barged	30,047	2,208	407,923	38,213	6,260	484,651
Total Transported	30,047	2,208	407,923	38,213	6,260	484,651
LITTLE GOOSE DAM						
Collected	36,696	408	240,998	24,718	5,476	308,296
Bypassed	0	0	0	0	0	0
Trucked	0	0	0	0	0	0
Barged	41,296	407	245,418	25,584	5,520	318,225
Total Transported	41,296	407	245,418	25,584	5,520	318,225
LOWER MONUMENTAL DAM						
Collected	23,554	1,270	138,740	12,765	5,575	181,904
Bypassed	860	179	9,739	997	639	12,414
Trucked	0	0	0	0	0	0
Barged	24,866	1,086	137,751	12,555	5,482	181,740
Total Transported	24,866	1,086	137,751	12,555	5,482	181,740
MCNARY DAM						
Collected	101,775	201,461	43,073	31,309	57,439	435,057
Bypassed	92,245	95,680	37,035	24,895	51,081	300,936
Trucked	7,035	70,968	4,888	4,978	4,115	91,984
Barged	0	0	0	0	0	0
Total Transported	7,035	70,968	4,888	4,978	4,115	91,984
PROJECT TOTALS						
Collected	191,345	205,359	805,651	105,152	74,340	1,381,847
Bypassed	93,685	95,859	50,914	25,892	51,720	318,070
Trucked	7,035	70,968	4,888	4,978	4,115	91,934
Barged	96,209	3,701	791,092	76,352	17,262	984,616
Total Transported	103,244	74,669	795,980	81,330	21,377	1,076,600

Cumulative Transportation Summary through 06/04/98

	Yearling	Subyearling	Steelhead	Coho	Sockeye	Total
	Chinook	Chinook				
LOWER GRANITE DAM						
Collected	1,496,067	4,680	4,940,623	144,074	47,260	6,632,704
Bypassed	102,011	33	124,023	1,425	0	227,492
Trucked	24,303	46	33,352	93	10	57,804
Barged	1,443,891	4,596	4,827,101	142,367	47,195	6,465,150
Total Transported	1,468,194	4,642	4,860,453	142,460	47,205	6,522,964
LITTLE GOOSE DAM						
Collected	882,404	408	1,475,064	45,504	15,329	2,418,709
Bypassed	0	0	0	0	0	0
Trucked	568	0	1,097	5	0	1,870
Barged	870,465	407	1,469,939	45,083	15,201	2,401,095
Total Transported	871,033	407	1,471,036	45,088	15,201	2,402,765
LOWER MONUMENTAL DAM						
Collected	488,443	1,292	927,441	25,782	12,335	1,455,293
Bypassed	4,255	189	11,667	1,008	639	17,758
Trucked	797	0	780	0	0	1,577
Barged	482,281	1,098	914,469	24,761	11,692	1,434,301
Total Transported	483,078	1,098	915,249	24,761	11,692	1,435,878
MCNARY DAM						
Collected	1,015,559	228,662	322,242	115,669	500,811	2,182,943
Bypassed	1,004,308	122,762	316,015	109,189	492,648	2,044,892
Trucked	7,035	70,968	4,888	4,978	4,115	91,984
Barged	0	0	0	0	0	0
Total Transported	7,035	70,968	4,888	4,978	4,115	91,984

Cumulative Transportation Summary through 06/04/98 (Continued)

	Yearling	Subyearling	Steelhead	Coho	Sockeye	Total
	Chinook	Chinook				
PROJECT TOTALS						
Collected	3,882,473	235,042	7,665,370	331,029	575,735	12,689,649
Bypassed	1,110,574	122,954	451,705	111,622	493,287	2,290,142
Trucked	32,703	71,014	40,117	5,076	4,125	153,035
Barged	2,796,637	6,101	7,211,509	212,211	74,088	10,300,546
Total Transported	2,829,340	77,115	7,251,626	217,287	78,213	10,453,581

Hatchery Release Summary

Schedule for Last Two Weeks

From 05/22/98 to 06/04/98

Hatchery	Species	FPC Lot ID	Number Released	Release Dates		Release Site	River Name
				Begin	End		
Nez Perce Tribe							
Kooskia	Coho	98138	220,000	5/11	05/22	Kooskia H	Clearwater R
Lyons Ferry	FA Chinook	98087	51,500	05/14	07/07	Pittsburg Landing	Snake River
	FA Chinook	98086	31,500	06/01	0710	Clearwater R	Clearwater R, Main Fk
	Agency Total:		303,000				
ODFW							
Big Canyon	SU Steelhead	98107	85,000	05/13	05/27	Big Canyon H	Grande Ronde R
	Agency Total:		85,000				
Umatilla Tribe							
Thornhollow	FA Chinook	98047	2,682,000	05/28	06/01	Thornhollow Acclim Pd	Umatilla R
	Agency Total:		2,682,000				
USFWS							
Entiat	SP Chinook	98064	164,999	05/28	05/28	Entiat H	Entiat River
	Agency Total:		164,999				
WDFW							
Klickitat	Coho	98095	1,100,000	04/20	06/10	Klickitat H	Klickitat R
	FA Chinook	98096	4,000,000	05/21	06/20	Klickitat H	Klickitat R
Wells	SU Steelhead	98030	64,703	04/24	05/22	Wells H	Mid-Columbia R
	SU Steelhead	98031	251,300	04/24	05/22	Methow R	Mid-Columbia R
	SU Chinook	98032	540,000	06/04	06/15	Wells H	Mid-Columbia R
	Agency Total:		5,956,003				
Yakima Tribe							
Lost Creek	Coho	98147	300,000	04/24	06/04	Naches R	Yakima R
Prosser	FA Chinook	98153	1,700,000	05/08	06/12	Prosser Acclim Pd	Yakima R
Roza	Coho	98150	690,000	04/30	05/30	Roza Acclim Pd	Yakama R
	Agency Total:		2,690,000				
	Total Release:		11,881,002				

Hatchery Release Summary

Schedule for Next Two Weeks

From 06/05/98 to 06/18/98

Hatchery	Species	FP Lot ID	Number Released	Release Dates		Release Site	River Name
				Begin	End		
WDFW							
Priest Rapids	FA Chinook	98140	6,700,000	06/15	06/25	Priest Rapids H	Mid-Columbia R
Ringold	FA Chinook	98145	3,500,000	06/15	06/25	Ringold Springs H	Mid-Columbia R
	Agency Total:		10,200,000				
	Total Release:		10,200,000				

Trip Log: June 10-11, 1998:
Bonneville, The Dalles, and John Day dams and WNP2

The purpose of visiting these dams was to better understand the efforts being made to increase the efficiency of passing juvenile salmon past the dams and how these efforts affect other system purposes. The purpose of visiting WNP2 was to better understand operating procedures of the nuclear plant and how it integrates with the hydropower generation of the Columbia River system.

Bonneville Dam. At Bonneville Powerhouse 2 a new juvenile salmon bypass system is being installed which consists of drilling a four-foot hole through the dam into the fish passageway, installing a buried two-mile long, a four-foot in diameter flume that is made of high density poly pipe, a juvenile monitoring facility at the end of the pipe, and a two level outfall into the river. This flume is designed to reduce the rapid pressure changes, high velocities, and turbulence associated with other means of passing the dam that disorient the juveniles and make them easy prey for predator birds and other fish. Dennis Schwartz and Dwight Gill, fisheries biologists at the project, said that the pipe will have slope of .001, a capacity of 30 cfs gravity flow, and that the smolts will take 35 minutes to traverse the pipe. Provisions are being made for a similar system to be installed at the first powerhouse and tie into the bypass pipe above the monitoring facility. The outfall will deposit the juveniles in faster moving water that will make it more difficult for birds and squawfish to catch them. The pipe is constructed of 60-foot sections that are heat-joined to make a smooth, non-abrasive joint. This is a \$62 million project.

At the first powerhouse two slot, four-unit prototype surface bypass collectors will be tested this year. The fish entrance will have adjustable slots: one is five feet wide, the other 20 ft wide, to compare the fish behavior with the two configurations. "Fish friendlier" turbines with minimum gap runners between the turbine blades and their hub, are also being installed this year. These improvements are expected to raise survival of juvenile chinook salmon from the current level of 88% to approximately 95%.

There are over 200 researchers working on various research studies at the Bonneville Project.

The Dalles AVM.

Measuring the discharge from The Dalles Dam presents a challenge in that the high velocities and flat slope caused by the Bonneville Dam pool render the traditional means of measurement, staff gage with stage discharge curve or a set of slope gages, ineffective. An Acoustic Velocity Meter (AVM) and a pressure sensor connected to a nitrogen pressure conoflow system (commonly called a bubble gage) are connected to provide accurate reading of the river discharge below the dam. The AVM (the new model is now called an Ultrasonic Velocity Meter or UVM) transmits a 200 kHz acoustic signal diagonally across the river to a second electronic unit which detects the signal and transmits another signal back to the initial transmitter/receiver. Special electronics measures the difference in transmission time between the two signals (the Doppler effect) which is proportional to the velocity, and discharge, of the river. A 1700-ft long cable connects the two transmitter/-receivers. Stage and velocity data are recorded every 30 minutes.

The Dalles Dam. At The Dalles Dam the ice/trash sluiceway currently passes 43% of the downstream migrating salmon while consuming only 3% (3500 cfs) of the water past the project. Studies are underway to relocate the sluiceway outfall from the present site adjacent to the powerhouse to a site downstream with fewer undesirable currents caused by the cross-channel discharge from the powerhouse. Other studies are underway to keep more of the juveniles surface-oriented to take advantage of the sluiceway. The juvenile bypass system currently in use for the remainder of the juveniles requires the fish to sound 70 feet, which they prefer not to do, to be guided by the fish screens into the current bypass channel. This diving subjects them to high pressures and velocities which are detrimental to their downstream passage. A surface-bypass system that would eliminate these hazards and direct the juveniles into the ice/trash sluiceway is being studied.

John Day Dam. At John Day Dam a new smolt monitoring and bypass system is in operation. The downstream migrants that approach the powerhouse are now directed into a 1200-foot long elevated chute and travel at speeds of 4-5 feet per second. Near the end of the flume they pass a PIT (Passive Integrated Transponder) tag detector which reads the tag, which contains information on the juveniles hatching, tagging site, and condition at the time of tagging, and are directed either into a research facility or back into the river below the dam. These tags can also be read on returning adults to help study the survival and return rates of hatchery and wild fish. With the completion of this facility tagging and monitoring of fish at five of the eight dams on the lower Columbia and Snake rivers. From the walkway along side the flume numerous shad were observed resting in the pools of the fish ladders.

Washington Public Power Supply System's Plant 2 (WNP2). WNP2 is one of four power plants owned by WPPSS; the other three are Centralia coal plant in western Washington, Boardman coal plant in eastern Oregon, and Colstrip coal plants in eastern Montana. The Plant has a nameplate rating of 1154 mW of electric power which compares to 1080 mW at Bonneville Dam, 986 mW at McNary Dam, and 810 mW at each of Lower Monumental, Little Goose, and Lower Granite dams on the lower Snake River. Six mechanically driven cooling towers dissipate residual heat from the cooling system water. Unlike the natural draft used in tall cooling towers at other thermal plants, the dry air of the desert prevents the development of a natural draft, necessitating a fan-driven cooling towers. Five crews rotate through the control room: one crew is in training and retraining, one on vacation, and three on work rotation. The steam turbine turns at 1800 rpm as compared to 3600 rpm at the Clark Public Utility turbine rate of 3600 rpm, and Bonneville Dam turbines at approximately 76 rpm. WNP2 has an energy in-energy out efficiency of about 35% to produce electric power at 20.8 mills/kWh as compared to 54% efficiency at about 23 mills/kWh at the Clark PU natural gas fired steam turbine, and 95% efficiency at about 10 mills/kWh at the Corps' hydroelectric plants.

Several items were notable at WNP2. First, was the security, not only to get into the facility but also to get to the various components within the facility. Second, was the use of airlocks and positive and negative air pressures, depending upon location, to eliminate or contain any contaminated air. The third was the great attention to detail and caution used in the control room to bring the plant back on line after refueling.