

APPENDIX A: 1990 Water Budget Coordinated Plan of Operation



DEPARTMENT OF THE ARMY

NORTH PACIFIC DIVISION, CORPS OF ENGINEERS

P.O. BOX 2870

PORTLAND, OREGON 97208-2870

April 6, 1990

REPLY TO
ATTENTION OF:

Water Management Branch

APR 1990
FISH PASSAGE
CENTER

SEE DISTRIBUTION

SUBJECT: Water Budget Coordinated Plan of Operation

Enclosed for your information is the Corps' 1990 Water Budget Coordination Plan of Operation (CPO), which provides a method for using the Water Budget during the spring of 1990.

The CPO has been developed in cooperation with the Fish Passage Managers, fishery agencies, Bonneville Power Administration, Bureau of Reclamation, utility companies and others. It is consistent with provisions of Section 300 of the Northwest Power Planning Council's Fish and Wildlife Program.

Contact Russell George (503/326-3745) or Bolyvong Tanovan (503/326-3764) of the Corps' Reservoir Control Center if you have questions or desire more information.

Sincerely,

Nicholas A. Dodge, P.E.
Chief, Water Management Branch

Enclosure

DISTRIBUTION:

Douglas County PUD #1
Grant County PUD #2
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Idaho Power Company
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Northwest Power Pool
Mid-Columbia PUDs-Portland

CORPS OF ENGINEERS NORTH PACIFIC DIVISION
PORTLAND, OREGON

1990 WATER BUDGET

COORDINATED PLAN OF OPERATION



CENPD-EN-WM
March 20, 1990

1990 WATER BUDGET COORDINATED PLAN OF OPERATION

1. Introduction

This Coordinated Plan of Operation (CPO) provides a method for using the Water Budget to aid the spring outmigration of juvenile salmonids. It has been developed by the U.S. Army Corps of Engineers in cooperation with the Fish Passage Managers, fishery agencies, Indian tribes, Bonneville Power Administration (BPA), U.S. Bureau of Reclamation (USBR), utility companies, and others for use during the April 15 - June 15, 1990 period.

2. Water Supply Forecasts

A copy of the interagency coordinated March 1 Water Supply Forecasts issued by the National Weather Service's Northwest River Forecast Center is attached as Enclosure 1. These forecasts are based on March 1 hydrologic conditions and median precipitation during the March through July period. They are summarized in Table 1 for key locations, in thousands of acre-feet (KAF) and percent of normal (%):

Table 1. Forecast Summary

| <u>Location</u> | <u>Period</u> | | <u>Period</u> | |
|-------------------|----------------|------------|----------------|------------|
| | <u>Jan-Jul</u> | | <u>Apr-Jul</u> | |
| | <u>(KAF)</u> | <u>(%)</u> | <u>(KAF)</u> | <u>(%)</u> |
| Grand Coulee | 69,100 | 107 | 59,900 | 107 |
| Priest Rapids (*) | 77,500 | 108 | 66,800 | 108 |
| Brownlee | 5,300 | 52 | 3,170 | 52 |
| Dworshak | 3,340 | 91 | 2,580 | 91 |
| Lower Granite | 23,500 | 76 | 18,100 | 80 |
| The Dalles | 104,000 | 96 | 85,600 | 98 |

(*) Estimated from Rock Island forecasts

3. Reservoir Status

The reservoir system, in terms of Mw-months, is 40 percent full compared to only 14 percent full at this time in 1989. This improvement is the result of the reservoir system nearly reaching full content following the 1989 freshet and average to well-above average natural streamflows since autumn 1989. Most reservoirs are still being drafted to meet flood control space requirements. Table 2 summarizes the status of major reservoirs as of March 1 and the projected April 1 elevations resulting from the latest (March 20, 1990) forecasts. The March 1, 1989 elevations are also shown between brackets for comparison purposes.

Table 2. Reservoir Elevations

| <u>Reservoirs</u> | <u>Max/Min Limits (MSL)</u> | <u>Max Capacity (MAF)</u> | <u>Elevation</u> | | <u>Frcst. Elevation</u> |
|-------------------|-------------------------------------|-----------------------------------|------------------------------|------------------------------|-------------------------|
| | | | <u>Mar 1, 1990 (MSL)</u> | <u>Apr 1, 1990 (MSL)</u> | |
| Mica | 2470/2394 | 7.0 | 2402 (2367) 2414 (2394) * | 2387 (2352) 2406 (2383) | |
| Arrow | 1444/1378 | 7.1 | 1405 (1388) | 1391 (1390) | |
| Duncan | 1892/1794 | 1.4 | 1827 (1804) | 1827 (1793) | |
| Libby | 2459/2287 | 5.0 | 2342 (2323) | 2325 (2322) | |
| Hungry Horse | 3560/3336 | 3.2 | 3514 (3437) | 3498 (3415) | |
| Albeni Falls | 2062/2050 | 1.2 | 2052 (2052) | 2052 (2052) | |
| Grand Coulee | 1290/1208 | 5.2 | 1282 (1230) | 1270 (1219) | |
| Dworshak | 1600/1445 | 2.0 | 1533 (1479) | 1530 (1503) | |
| Brownlee | 2077/1976 | 1.0 | 2052 (2030) | 2050 (2044) | |

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* Adjusted Elevation

** This column shows March 1, 1989 elevations

4. Data Exchange

a. The Fish Passage Managers shall be represented at the daily RCC briefings. The managers will prepare and deliver a fisheries report for each Thursday briefing from April 15 through June 15.

b. The Corps and BPA shall make available to the Fish Passage Managers and the Northwest Power Planning Council Advisor the forecasts prepared for system planning purposes.

5. Priest Rapids Flow Augmentation for Fish

a. The Water Budget at Priest Rapids will be implemented using weekly average flows. It will be based upon advance projections of weekly average flows provided by the Corps after consultation with USBR and BPA. This flow projection may be composed of both power and nonpower components. The flow component for power needs will be provided to the Corps by BPA. The flow component for nonpower needs will be determined by the Corps. Water Budget requests are to be within the time period and flow and volume limits identified in the Council's Program.

b. During the period of April 15 through June 15, the Corps will identify the projected Monday through Sunday weekly average flow by 3:00 p.m. on Wednesday of the preceding week.

c. The Fish Passage Managers will relay their decision, as to whether or not to augment weekly average flow for the next week, to the Corps' RCC by noon on Thursday of the preceding week. If the Fish Passage Managers decide to augment the projected weekly average flow, the Water Budget usage will be measured as the difference between the actual average weekly flows (or the Fish Passage Managers' average weekly flow request, whichever is less) and the power base flow of 76 kcfs and will not exceed 3.45 MAF for the season.

d. When a Water Budget request is in effect, the weekend and holiday average flows will not be lower than 80 percent of the average of the five preceding weekdays.

e. Should the Fish Passage Managers decide not to augment flows with the Water Budget during a given week, reasonable efforts will be made to provide the projected weekly average flow identified by the Corps on the preceding Wednesday. Forecasting errors may cause deviation from the actual flows delivered. If the deviations are considered by the Fish Passage Managers to cause an adverse impact to the migration, a change may be made in the Water Budget request for the remainder of the specified week (Monday - Sunday); implementation of the request will be dependent on the Corps coordinating the request with affected parties.

If the projected weekly average flow is greater than 110 kcfs, the Fish Passage Managers may request that the projected weekly average flow be guaranteed. During this flow condition, the weekend and holiday flows be no less than 85 kcfs.

f. The RCC and Fish Passage Managers will jointly monitor the run-off and juvenile migration and may, by mutual agreement and after consultation with other affected parties, modify the operation at Priest Rapids.

6. 1990 Lower Granite Water Budget

a. Requests from the Fish Passage Managers for flow augmentation at Lower Granite (LWG) will be met first from uncontrolled run-off, then from Dworshak (DWR) and Brownlee (BRN) storage under the following conditions:

(1) When BPA has an active storage account with IPC, BPA may in consultation with all parties, choose to release only from BRN. Should the release from BRN not meet the Fish Passage Managers request, then additional flow may be released from DWR.

(2) When BPA does not have an active account with IPC, requests to augment daily average flows at LWG will be met with releases from either or both DWR and BRN. Water Budget release from DWR will be done in accordance with provisions of Section 6.a.(3) below. Water Budget release from BRN will be done in accordance with applicable IPC/BPA Contract.

(3) Water shapable for Water Budget in DWR that can be used to meet an average daily flow at LWG will be based on Enclosure 2. DWR discharges in excess of the 10 kcfs powerhouse capacity may be requested by the Fish Passage Managers subject to Water Budget availability. These higher flows up to a maximum release of 25 kcfs will be provided on a case-by-case basis. Additional flows beyond the Water Budget commitment may be provided from DWR if needed for fish migration and if DWR refill is not jeopardized.

b. Every weekday, if available, the RCC will provide the Fish Passage Managers with (1) a 5-day forecast for the Snake River flow at LWG prepared by the NOAA River Forecast Center, (2) a 5-day operational forecast prepared by IPC for releases at BRN, and (3) a 5-day operational forecast prepared by the Corps for releases at DWR.

c. The Fish Passage Managers, utilizing the information provided in paragraph 6a and other relevant data, shall make flow augmentation requests to the RCC no less than 48 hours in advance of the expected implementation to allow BPA and IPC to schedule flows. Requests will be made Monday through Friday (except holidays) verbally to the RCC and followed by written confirmation. No requests for flows or modifications will be acted upon between Friday 10:00 a.m. and Monday 8:00 a.m.

d. Water Budget usage at DWR and BRN will be measured as the difference between the daily outflow resulting from the Fish Passage Managers' request and the daily operations projection from the Corps. The total Water Budget quantity from DWR will be identified by the Corps from the April 1 forecast and using Enclosure 2. The Water Budget quantity for BRN will be identified by IPC on April 15, with subsequent updates. If BPA has stored water in BRN, the quantity will be identified by BPA on April 15, with subsequent updates.

e. The RCC and Fish Passage Managers will jointly monitor the run-off and juvenile migration and may, by mutual agreement and in consultation with other affected parties, modify the operation at LWG.

7. Lower Columbia River Weekend and Holiday Flows

While there is no Water Budget requirement at the lower Columbia River projects, a 1990 objective for weekend flows will be to not average less than 80 percent of the average flow for the previous five weekdays during the period April 15 through June 15. Memorial Day weekend will be treated as in paragraph 5d above.

8. Nonimplementable Request

A Water Budget request may not be implemented if it conflicts with other non-power requirements. The severity of the conflict will be analyzed by the Corps and appropriate action taken with documentation of the basis for the decision forwarded to the Fish Passage Managers and the Power Planning Council Advisor.

ENCLOSURE 1. SEASONAL WATER SUPPLY FORECASTS ISSUED BY NATIONAL WEATHER SERVICE
NORTHWEST RIVER FORECAST CENTER, PORTLAND, OREGON

MARCH 1, 1990 FINAL WATER SUPPLY FORECASTS

| <u>STREAM AND STATION</u> | <u>PERIOD</u> | <u>FORECAST</u> | <u>%</u> | <u>AVERAGE</u> |
|------------------------------|---------------|-----------------|----------|----------------|
| COLUMBIA RIVER | | | | |
| MICA RESERVOIR INFLOW, BC | FEB-SEP | 15200.0 | 114 | 13280. |
| | APR-SEP | 14700.0 | 114 | 12840. |
| ARROW LAKES INFLOW | FEB-SEP | 30800.0 | 114 | 27080. |
| | APR-SEP | 29300.0 | 114 | 25800. |
| BIRCHBANK, BC (1) | APR-SEP | 50400.0 | 114 | 44390. |
| GRAND COULEE, WA (1) | JAN-JUL | 69100.0 | 107 | 64690. |
| | APR-SEP | 71400.0 | 107 | 66460. |
| ROCK ISLAND DAM BLO, WA (1) | APR-SEP | 77800.0 | 108 | 72250. |
| THE DALLES NR, OR (1) | APR-SEP | 99800.0 | 98 | 101800. |
| | JAN-JUL | 104000.0 | 96 | 108700. |
| KOOTENAI RIVER | | | | |
| LIBBY RES INFLOW, MT (1) | APR-SEP | 7990.0 | 116 | 6903. |
| KOOTENAY RIVER | | | | |
| KOOTENAY LAKE INFLOW, BC | APR-SEP | 18800.0 | 111 | 16930. |
| DUNCAN RIVER | | | | |
| DUNCAN RESERVOIR INFLOW, BC | FEB-SEP | 2530.0 | 108 | 2332. |
| | APR-SEP | 2440.0 | 108 | 2251. |
| CLARK FORK | | | | |
| ST. REGIS, MT (1) | APR-SEP | 3810.0 | 88 | 4325. |
| PEND OREILLE RIVER | | | | |
| PEND OREILLE LAKE IN, ID (1) | APR-SEP | 14200.0 | 95 | 14930. |
| S.F. FLATHEAD RIVER | | | | |
| HUNGRY HORSE RES IN, MT (1) | APR-SEP | 2380.0 | 106 | 2248. |
| FLATHEAD RIVER | | | | |
| FLATHEAD LAKE INFLOW, MT (1) | APR-SEP | 7700.0 | 108 | 7150. |
| COEUR D'ALENE RIVER | | | | |
| COEUR D'ALENE LAKE IN, ID | APR-SEP | 2890.0 | 102 | 2821. |
| SIMILKAMEEN RIVER | | | | |
| NIGHTHAWK NR, WA (1) | APR-JUL | 1200.0 | 90 | 1333. |
| OKANAGAN RIVER | | | | |
| TONASKET NR, WA (1) | APR-SEP | 1440.0 | 87 | 1661. |
| CHELAN RIVER | | | | |
| LAKE CHELAN INFLOW, WA (1) | APR-SEP | 1280.0 | 108 | 1184. |

| | | | | |
|---|---------|---------|-----|--------|
| YAKIMA RIVER PARKER NR, WA | APR-SEP | 1980.0 | 95 | 2075. |
| SKAGIT RIVER CONCRETE NR, WA | APR-SEP | 6200.0 | 94 | 6623. |
| COWLITZ RIVER MAYFIELD RES INFLOW, WA | APR-SEP | 2050.0 | 101 | 2036. |
| | APR-JUL | 1790.0 | 100 | 1782. |
| CASTLE ROCK, WA | APR-SEP | 2850.0 | 106 | 2687. |
| SNAKE RIVER JACKSON LAKE INFLOW, WY (1) | APR-JUL | 680.0 | 86 | 795. |
| PALISADES RES INFLOW, ID (1) | APR-JUL | 2600.0 | 79 | 3298. |
| HEISE NR, ID | APR-JUL | 2770.0 | 79 | 3524. |
| WEISER, ID (1) | APR-JUL | 2950.0 | 51 | 5786. |
| BROWNLEE RES INFLOW | APR-JUL | 3170.0 | 52 | 6147. |
| LOWER GRANITE RES IN, WA (1) | JAN-JUL | 23500.0 | 76 | 31060. |
| | APR-JUL | 18100.0 | 80 | 22760. |
| TETON RIVER ST. ANTHONY NR, ID | APR-JUL | 300.0 | 78 | 387. |
| HENRYS FORK REXBURG NR, ID | APR-JUL | 855.0 | 68 | 1260. |
| PORTNEUF RIVER TOPAZ, ID | APR-SEP | 63.0 | 66 | 96. |
| BIG LOST RIVER MACKAY RESERVOIR INFLOW, ID | APR-JUL | 81.0 | 50 | 162. |
| BIG WOOD RIVER HAILEY, ID (1) | APR-JUL | 140.0 | 52 | 268. |
| MAGIC RESERVOIR INFLOW, ID | APR-JUL | 140.0 | 43 | 322. |
| LITTLE WOOD RIVER CAREY NR, ID | APR-JUL | 51.0 | 52 | 99. |
| DESCHUTES RIVER BENHAM FALLS, OR | APR-SEP | 480.0 | 68 | 709. |
| OWYHEE RIVER OWYHEE RES INFLOW, OR | MAR-JUL | 440.0 | 74 | 591. |
| BOISE RIVER BOISE NR, ID (1) | APR-JUL | 920.0 | 61 | 1508. |
| MALHEUR RIVER DREWSEY NR, OR | MAR-JUL | 33.0 | 31 | 108. |
| N.F. MALHEUR RIVER BEULAH RES INFLOW, OR (1) | MAR-JUL | 21.0 | 26 | 81. |

| | | | | |
|--|--------------------|------------------|----------|----------------|
| PAYETTE RIVER HORSESHOE BEND NR, ID (1) | APR-JUL | 1180.0 | 69 | 1717. |
| WEISER RIVER WEISER NR, ID (1) | APR-JUL | 270.0 | 65 | 414. |
| POWDER RIVER SUMPTER NR, OR | MAR-JUL | 37.0 | 52 | 71. |
| SALMON RIVER WHITEBIRD, ID (1) | APR-JUL | 4940.0 | 78 | 6322. |
| GRANDE RONDE RIVER LA GRANDE, OR TROY, OR (1) | MAR-JUL MAR-JUL | 157.0 1220.0 | 72 81 | 218. 1512. |
| CLEARWATER RIVER OROFINO, ID (1) | APR-JUL | 4360.0 | 89 | 4889. |
| N.F. CLEARWATER RIVER DWORSHAK RES INFLOW, ID (1) | APR-JUL APR-SEP | 2580.0 2750.0 | 91 91 | 2822. 3010. |
| CLEARWATER RIVER SPALDING, ID (1) | APR-JUL APR-SEP | 7400.0 7820.0 | 93 93 | 7916. 8378. |
| UMATILLA RIVER GIBBON NR, OR PENDLETON, OR | APR-JUL APR-JUL | 49.0 100.0 | 68 67 | 72. 149. |
| S.F. WALLA WALLA RIVER MILTON NR, OR | APR-JUL | 40.0 | 73 | 55. |
| M.F. JOHN DAY RIVER RITTER, OR (1) | APR-JUL | 77.0 | 64 | 120. |
| N.F. JOHN DAY RIVER MONUMENT NR, OR | APR-JUL | 380.0 | 64 | 590. |
| JOHN DAY RIVER SERVICE CREEK, OR (1) | APR-SEP | 565.0 | 66 | 858. |
| CROOKED RIVER PRINEVILLE RES INFLOW, OR | MAR-JUL | 83.0 | 47 | 176. |
| OCHOCO CREEK OCHOCO RES INFLOW, OR | MAR-JUL | 16.0 | 48 | 33. |
| S. SANTIAM RIVER WATERLOO, OR | APR-SEP | 575.0 | 100 | 576. |
| N. SANTIAM RIVER MEHAMA, OR | APR-SEP | 870.0 | 102 | 854. |

