

## **SYSTEM OPERATIONAL REQUEST: #2000-1**

- *The following State and Federal Salmon Managers have participated in the preparation of this SOR: Oregon Department of Fish & Wildlife, U.S. Fish & Wildlife Service, Washington Department of Fish and Wildlife, National Marine Fisheries Service, and the Idaho Department of Fish & Game.*

**TO:**            **Brigadier General Strock**    **COE-NPD**  
                  **William Branch**                    **COE-Water Management**  
                  **Cindy Henriksen**                   **COE-RCC**  
                  **Doug Arndt**                           **COE-P**  
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                  **Judith Johansen**                    **BPA-Administrator**  
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**FROM:**              
                  **Marv Yoshinaka, Chairperson, Salmon Managers**

**DATE:**            **February 28, 2000**

**SUBJECT:**    Provision of Bonneville tailwater operating criteria. The federal operators and regulators requested the development of tailwater operating criteria to provide protection to the Ives/Pierce Islands chum redds. If the operators choose to operate to a tailwater elevation, the following analysis identifies the tailwater elevation that will provide protection of 2.5 feet at gage 2 to provide some water over the highest chum redd, under all conditions.

### **SPECIFICATIONS:**

Maintain the Bonneville Tailwater elevation at a minimum of 15.7 feet to provide some water over the highest chum redd at Ives Island. This should maintain a minimum elevation of 2.5 feet at Gage 2 on Ives Island, under all tidal and backwater effect conditions. Alternatively, BPA could manage and plan flow and tailwater operations according to the Vancouver river gauge prediction developed by NOAA.

### **JUSTIFICATION:**

The federal parties have requested a management objective for the Ives /Pierce Islands spawning area below Bonneville Dam, in terms of tailwater elevation. The FPC staff analyzed the hourly data through February 24, to develop a tailwater elevation objective. In the latest analysis the objective was to present the Bonneville Dam tailrace elevation that provides adequate water levels at Gage 2 located nearest the highest chum redds. The COE has asked that we make our recommendations in terms of Bonneville Dam tailrace elevations and not in terms of Bonneville Dam flows. This analysis establishes the tailwater elevation required to manage on that basis.

A total of 1,400 hourly records of Bonneville tailrace elevation, Bonneville flow, Vancouver elevation, Gage 1 height, and Gage 2 height readings taken between November 19,

1999 and February 24, 2000 have been used in the current analysis. All earlier data from the preceding season has been excluded since the location of Gage 2 has changed. Currently the difference in water heights between Gage 1 and Gage 2 averages nearly 1.5 ft at the lower water depths and 1.0 ft at higher water depths, less than the average 2-2.5 ft of the prior season.

The relation between Ives Gage 2 height and the Bonneville Dam tailrace elevation (see attached plot) shows Bonneville Dam tailrace elevations of 15.7 feet maintaining Gage 2 heights mostly between 2.5 and 4 feet. The minimum of 2.5 feet at Gage 2 is necessary to maintain some water above the highest chum redds for successful emergence from the gravel and to avoid dewatering events and mortality such as were documented on February 22, 2000.

Differences between Gage 1 and Gage 2 heights in hourly readings are more related to tidal influences (based on Vancouver elevation readings) than either Bonneville Dam flows or tailrace elevations. The COE has requested that we make our requests in terms of Bonneville Dam tailrace elevations, which they control. The requested 15.7 ft tailrace elevation is predicted to keep the Gage 2 readings at or above 2.5 feet as long as Vancouver water elevations remain above 4 ft (see the bivariate contour plot). Only 0.8% of the readings at Vancouver have been below 4 ft so far this season, down to a minimum of 3.8 ft.