SYSTEM OPERATIONAL REQUEST: #2002-5

- ***The following State, Tribal and Federal Salmon Managers have participated in the preparation and support this SOR: U.S. Fish & Wildlife Service, National Marine Fisheries Service, Oregon Department of Fish & Wildlife, Columbia River Inter Tribal Fish Commission, Nez Perce Tribe and the Washington Department of Fish and Wildlife. *****

TO:

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Raymond R. Boyce

FROM: **Ron Boyce, Chairperson, Salmon Managers**

DATE: **June 25, 2002**

SUBJECT: **Brownlee Operations for Fall Chinook Migration**[1]

SPECIFICATIONS:

- Draft Brownlee reservoir to shape USBR water which will not pass through Brownlee until after July 31 to assist in meeting the July/early August flow objective at Lower Granite Reservoir. This draft will likely be between 150 and 215 kaf (elevation 2066' to 2061' from full pool) by July 31. This volume of pass through and draft should total between 300 and 427 kaf of USBR water from the Upper Snake River basin..
- Draft an additional 137 KAF of water volume by August 10, to assist in meeting the summer flow objective of 51 kcfs at Lower Granite, pursuant to the current Northwest Power Planning Council Fish and Wildlife Program draft from Brownlee Reservoir.
- Draft the remainder of the Northwest Power Planning Council required volume from Brownlee reservoir, 100 KAF during the rest of August to assist in meeting the summer flow objective of 51 kcfs at Lower Granite Reservoir.

[1] This recommendation is limited to 2002. It should not be construed as fulfilling the Idaho Power Company's obligations under the Endangered Species Act.

- It would be most beneficial for salmon to begin refill at Brownlee after August 31.
- Flow augmentation should be provided in a manner to avoid adverse impacts to water quality and other fish and wildlife resources.
- USBR should take all reasonable effort to deliver water held as powerhead for Anderson Ranch, Palisades, and Minidoka to minimize the deficit between the 427 KAF and actual deliveries.

** The Idaho Department of Fish and Game has reviewed the proposed operation and the technical rationale and support data for the proposal. IDFG agrees that the data and analysis clearly show the benefit of flow and temperature on fall chinook survival. IDFG agrees that the proposed operation will benefit juvenile fall Chinook survival.

JUSTIFICATION:

The importance of flows and water temperature for summer migrating chinook salmon has been well documented. Analysis based upon multiple regression models, indicate that downstream migration rates for Snake River fall chinook salmon would decrease from 0.1 to 0.2 km/day if summer flow augmentation was not implemented. This translates to the average fish taking from 1 to 5 days longer to pass Lower Granite Dam without the aid of summer flow augmentation.

Additional analysis indicated that summer flow augmentation increased survival of fall chinook salmon smolts by up to 24 percent. In recent analysis[2] to determine the factors affecting survival of wild Snake River fall chinook salmon the predictor variables flow and water temperature were not correlated and both variables entered into a multiple regression model fit to describe survival. Flow and temperature explained 92.3% of the observed variability in survival. Based on this regression model survival was predicted to change by approximately 3% with each change of 3.5 kcfs (100 m^3/s) in flow when temperature was held constant. The change in survival was approximately 7% for each 1^o C. increase or decrease in temperature when flow was held constant. Connor concluded that flow and temperature influence survival simultaneously.

Recent passage timing of juvenile fall chinook migrants, with the present configuration of reservoir storage and run-of-river hydroelectric projects and irrigation withdrawals is provided in the attached plots. The attached memorandums describe recent juvenile fall chinook timing in the Snake and Lower Columbia Rivers. These recent passage data support the requested utilization of migration flow augmentation from the Hells Canyon Complex.

The USBR volume is presented as a range not less than 300 kaf for 2002. The 300 kaf volume does not meet the requirements of the NWPPC fish and wildlife program and does not meet Biological Opinion flow objectives. With IPC shaping, the 300 kaf will provide flow through early August. The attached plot of wild fall Chinook passage shows that significant passage of wild fall Chinook occurs in the Snake River in August and into September. Volume in addition to 300 KAF is needed from Upper Snake River reservoirs to provide passage flow mitigation for August juvenile migrants. NMFS' Biological Opinion and the NWPPC Fish and Wildlife

[2] Connor, W. P. 2001. Juvenile life history, downstream migration rate, and survival of wild Snake River fall chinook salmon. PH.D. Dissertation. University of Idaho, Moscow, Idaho.

program call for the USBR to provide up to 427 kaf of volume from Upper Snake River reservoirs. The volumes and flow targets were not achieved in 2001. The fisheries managers seek to avoid the effect of sequential years of not providing mitigation measures and potentially serious adverse affecting migrating fall chinook. We urge the USBR to make best efforts to provide the full volume of 427 KAF.