SYSTEM OPERATIONAL REQUEST: #2005-17

The following State, Federal, and Tribal Salmon Managers have participated in the preparation and support this SOR: U.S. Fish & Wildlife Service, Idaho Department of Fish and Game, the Washington Department of Fish and Wildlife, NOAA Fisheries, Nez Perce Tribe, Shoshone-Bannock Tribes, and the Columbia River Inter-Tribal Fish Commission.

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FROM: **David A. Wills, Chairperson, Salmon Managers**

DATE: **July 5, 2005**

SUBJECT: **Dworshak Operations**

SPECIFICATIONS:

- Continue outflows of 7 Kcfs at Dworshak through July 10th, 2005, however, after July 7th, 2005 increase outflows at Dworshak to 10 Kcfs if temperatures at Lower Granite exceed 67 °F (19.4°C) on a 24-hr rolling average. On July 11th, 2005 increase outflows to 10 Kcfs until further notice. Continue to target 46-48°F outflow water temperature over the specified time.

JUSTIFICATION:

Juvenile Fall Chinook Passage Timing

Subyearling Chinook continue to pass Snake River projects in relatively good numbers. Based on preliminary analysis of PIT-tag data collection of subyearling chinook at Snake River SMP sites is low compared to other recent years due to spill. This makes analysis of timing data more tentative at this point. The passage of juvenile fall chinook is progressing, with wild marked fish from the Snake River being detected daily at Lower Granite.

Travel Time Survival of juvenile fall chinook

In the compilation of travel time and survival data by NOAA Fisheries "Travel Time/Survival White Paper" (March 2000), NOAA Fisheries concludes that “Estimated survival probability from release points in the Snake River Basin to Lower Granite Dam was significantly correlated with flow, water temperature and turbidity”. NOAA Fisheries also concludes that the high correlation among variables precludes the determination of effects of these variables individually. A flow travel time relationship has been established for sub-yearling chinook migrants. The flow travel time relationship has been confirmed consistently in various studies and monitoring programs. Recent information (Connor, 2003) has shown statistically significant relations between flow, temperature and survival for sub-yearling fall chinook.

Historical passage timing and distribution of fall chinook data shows that 90% of the wild chinook passage at Lower Granite occurs prior to August 30 and 97% of hatchery sub-yearling fall chinook of Clearwater and Snake River origin pass Lower Granite Dam prior to August 30. This data set is primarily comprised of Snake River origin fish. The limited data available for the Clearwater population indicates they pass Lower Granite Dam at a later date.

Water Temperature

An extensive literature review was compiled for the Environmental Protection Agency entitled, “A Review and Synthesis of Effects of Alterations to the Water Temperature Regime on Freshwater Life Stages of Salmonids with Special Reference to Chinook Salmon”. This review establishes water temperature as an important factor in all life stages of salmon. The review documents the detrimental effects of elevated water temperatures on all life stages of salmon, both juvenile and adult. The literature review has identified a water temperature of 21°C as the incipient lethal temperature for adult salmon. Washington State water quality standards for temperature in the mainstem Snake is 20°C. The maximum recommended water temperature in the NMFS BIOP at Lower Granite Dam is 20°C

The tailrace temperature at Lower Granite Dam is currently at a day average temperature of slightly less than 19 °C on July 4th, 2005.

Additional temperature considerations include growth of wild fall chinook in the Lower Clearwater River and needs of the Dworshak National Fish Hatchery.

Flows

The BIOP summer flow objective for Lower Granite Dam in 2004 is 50 Kcfs. Flows at Lower Granite from June 21 through July 4 have averaged 48.7 Kcfs, slightly below the NOAA Biological Opinion target. Migrating wild sub-yearling fall chinook salmon spend from 20 to 42 days in Lower Granite Reservoir primarily during the months of July and August. Migration conditions for wild subyearling Snake River fall chinook are improved by both flow and temperature. Higher summer flows generally decrease temperature, depending on the proportion of cool Dworshak water to warmer Upper Snake water.