

SYSTEM OPERATIONAL REQUEST: #2004-16

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, Oregon Department of Fish and Wildlife, 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: June 29, 2004

SUBJECT: Dworshak Operations

SPECIFICATIONS:

- On Wednesday afternoon (6-30-2004), ramp Dworshak outflows up to between 6.8 and 7.2 Kcfs, maintain through July 5th. On July 6th, further increase outflows to 10 Kcfs through July 7th. Target 45°F outflow water temperature through July 7th.

JUSTIFICATION:

Juvenile Fall Chinook Passage Timing

The passage of juvenile fall chinook is progressing. The hatchery fall chinook that were marked and released from acclimation ponds in various Snake and Clearwater River locations indicate that migrants from these releases are being detected at Lower Granite Dam. Although the PIT tagged sub-yearling fall chinook migration began to arrive at Lower Granite Dam a week later than in 2003, the number of tags recovered per day this year has increased rapidly. At the present time 23.3% of the PIT tagged fall chinook released have been detected at Lower Granite Dam, compared to 15% for this time in 2003.

Wild/natural subyearling fall chinook are currently rearing in the lower Clearwater River below Dworshak Dam. Water temperature affects growth rate. Cold water releases from Dworshak Dam can slow juvenile growth and alter out migration timing. Dworshak coldwater release strategies need to address the spectrum of Snake River fall chinook life history strategies and needs.

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 temperatures 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 has been increasing over the last week. Specifically, temperatures have increased from a day average temperature of 16.5 °C on June 23, 2004 to a current day average temperature of 18.7 °C on June 28, 2004.

Flows

The BIOP summer flow objective for Lower Granite Dam in 2004 is 50 Kcfs. Flows at Lower Granite from June 21 through June 27 have averaged 48.8 Kcfs, slightly below the NOAA Biological Opinion target. Wild sub-yearling fall chinook salmon spend from 20 to 42 days in Lower Granite Reservoir primarily during the months of July and August. Survival of wild subyearling Snake River fall chinook is influenced simultaneously by flow and temperature. Meeting summer flow targets increases flow and decreases temperature. Meeting summer flow targets in July and August increases survival of sub-yearling fall chinook migrants.