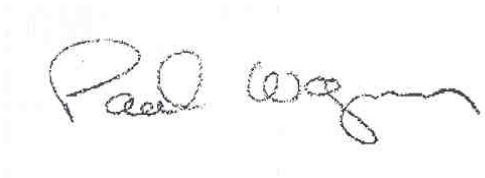
SYSTEM OPERATIONAL REQUEST: #2008-3

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

TO:	**Colonel Steven R. Miles**	**COE-NWD**
	James D. Barton	**COE-Water Management**
	Cathy Hlebechuk	**COE-RCC**
	Witt Anderson	**COE-P**
	Col. Thomas E. O'Donovan	**COE-Portland District**
	LTC Anthony Hofmann	**COE-Walla Walla District**
	J. William McDonald	**USBR-Boise Regional Director**
	Stephen J. Wright	**BPA-Administrator**
	Greg Delwiche	**BPA-PG-5**



FROM: **Paul Wagner Chairperson, Salmon Managers**

DATE: **May 20, 2008**

SUBJECT: Bonneville Dam Operations to Address Unacceptably High and Severe Descaling Rates

SPECIFICATIONS: Descaling in smolts at Bonneville Dam has reached 19% in yearling Chinook in the sample completed May 20, 2008. In order to reduce severe descaling and probable increased mortality, the Salmon Managers recommend the following:

- decrease total discharge in Powerhouse II at Bonneville Dam by reducing turbine operations to the lower end of the 1% efficiency range and,
- maintain spill attempting to not exceed 125% TDGS at the Cascade Island monitor.

JUSTIFICATION:

Descaling rates at Bonneville Dam over the past week have been relatively high, especially in yearling Chinook, and in many cases the descaling has been severe. Many of the descaled fish have had scales removed almost entirely from one side of the body. This level of descaling is thought to be lethal to smolts. The COE is presently cleaning the Vertical Barrier Screens (VBS) at Powerhouse II and have reported high levels of debris on the screens.

The total discharge at the powerhouse (a surrogate for efficiency rating where the higher the powerhouse flows the closer to the high end of the 1%) appears to be closely linked to the descaling levels seen in fish at the project during the past week (Figure 1).

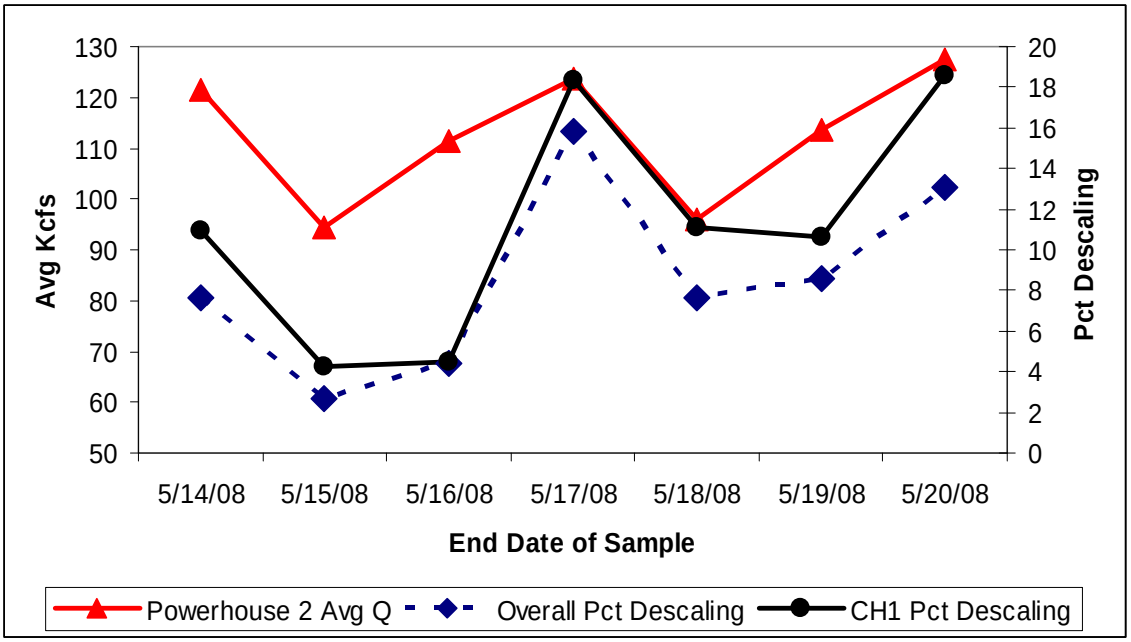


Figure 1. Descaling rates at Bonneville Dam Smolt Monitoring Facility for yearling Chinook and overall smolt descaling rate. The date in the figure represents the end date of sampling. The flows are from the previous dates 24 hour average.

Decreasing powerhouse II flows while simultaneously increasing spill would decrease the portion of fish entering into the powerhouse. Indications are that decreasing turbine loading could decrease descaling rate as suggested by the relation seen between descaling rate and powerhouse II discharge over the past several days.

Spill is generally accepted as the safest route for fish passage at the Federal Columbia River Power System (FCRPS) facilities in terms of both immediate and delayed survival effects.

One strategy that has been implemented at Bonneville Dam has been to maximize the proportion of fish that pass through non-turbine routes, as measured by maximizing Fish Passage Efficiency (FPE). "FPE and FGE are an indication of the effectiveness of measures to divert juveniles around the turbines, which are considered to have a higher mortality rate, compared to the bypass systems and spillway" (USACE 2002). Maximizing FPE has been a reported goal of the USACE.

The participants in this SOR recognize that decreasing the flow through the powerhouse by about 20 kcfs will cause an incremental increase in the level of TDG that is being generated by the project which is already approaching the 125% level. There is the potential that this level of TDG and the quantity of spill associated may pose risks to the adult salmonid population below

the project. The measure being proposed is an attempt to strike a balance between the harm observed on the juveniles passing through PH2 with the potential harm to adult salmonids.

In addition, we recommend that the Technical Management Team develop a procedure for responding to situations where spill may be the most effective response, but where Clean Water Act and Endangered Species Act requirements conflict.