State, Federal and Tribal Fishery Agencies Joint Technical Staff Memo

Columbia River Inter-Tribal Fish Commission
Idaho Department of Fish and Game
Oregon Department of Fish and Wildlife
Washington Department of Fish and Wildlife
U.S. Fish and Wildlife Service
Colville Tribe
Nez Perce Tribe

TO: Doug Baus, COE
TMT Chairperson

FROM: Tom Lorz, Vice Chair
Fish Passage Advisory Committee

SUBJECT: Spring Spill Operation at Lower Monumental Dam

DATE: June 26, 2012

The Fish Passage Advisory Committee (FPAC) has met and discussed spring spill implementation in the Snake River relative to the Fish Operations Plan for 2012 (FOP). In particular, members contend the operation that they have recommended for spill at the Lower Monumental (LMN) project (SOR 2011-02, and FPP Change Form12LMN007 Spill Pattern Change) is the best option to meet the objectives of both juvenile fish passage and total dissolved gas management addressed in the 2008 BiOp. In addition, we want to clarify a technically misleading statement in the 2011 and 2012 FOPs concerning the results of the juvenile passage study conducted at LMN in 2009.

The bulk spill pattern was originally accepted based on research showing that a uniform spill pattern, with smaller spill gate openings at lower river flows, resulted in slightly higher injury and mortality for spillway passed fish. Because of these concerns, the Salmon Managers continue to agree with using the bulk spill pattern at total river flows less than 60 Kcfs. However, in recent years concern has been expressed that the TDG production and consequent spill curtailment that occurs with the use of the bulk spill pattern at higher flows is problematic for RPA 29. Adherence to the bulk spill pattern up to flows of 140 KCFS often necessitates the COE water quality personnel to reduce spill amounts (to avoid exceeding the Ice Harbor forebay TDG standard) just as large numbers of smolts arrive at the project (see Figures 1&2 for examples).

The 2011 & 2012 FOPs state that: "Based on a previous year's study results, dam survival is higher using the "bulk" spill pattern compared to the "uniform" spill pattern." However, the authors of this 2009 study at Lower Monumental Dam (Hockersmith et al., 2010), clearly state that their results indicated no significant difference in direct concrete survival between the two spill patterns, which is how the results should be characterized. Further review of the Hockersmith et al., 2010 report (Table 1) shows that the only reason the bulk spill pattern concrete survival point estimate for yearling Chinook salmon (0.975) was slightly higher than the for the uniform pattern (0.973) was that turbine survival with the bulk spill pattern was estimated to be significantly greater than 100%, which is clearly an overestimation. Based on the results (Tables 1 and 2 in Hockersmith et al., 2010), concerns about spillway survival using the uniform spill pattern are not an issue at the recommended flow levels.

Given this information the statements in both the 2011 & 2012 FOPs, that dam survival is higher with the bulk spill pattern, are statistically inaccurate and misleading. The Salmon Managers have previously requested (SOR 2011-02 and FPP Change Form12LMN007 Spill Pattern Change) to change the spill pattern at Lower Monumental Dam to one that better meets the 2008 BiOp objectives of RPAs 15 & 29, to provide spill to improve juvenile fish passage while avoiding high TDG. The FOP does not consider that in the 2009 COE study of bulk and uniform spill patterns at Lower Monumental Dam (Hockersmith et al., 2010), more fish were passed via surface routes with less delay under the uniform spill pattern (the intent of RPA 29). The uniform spill pattern also performs better at meeting the intent of RPA 15 to reduce unnecessary TDG production. During the 2009 study, TDG in the Lower Monumental tailrace averaged 115.8% with an average spill of 36.0 Kcfs under the uniform spill pattern blocks, and averaged 118.1% with an average spill of 26.7 Kcfs under the bulk spill pattern blocks.

Technical information also indicates that switching to the uniform spill pattern at flows above 60 Kcfs at LMN should increase adult return rates and help meet life cycle survival metrics. The uniform pattern will reduce bypass passage, which should help address adult return concerns raised by the Buchanan et al. (2011) report on bypass effects. Buchanan et al. reported that "Bypass at Lower Monumental Dam appeared to be associated with reduced adult return rate for both spring Chinook salmon and steelhead, with a slightly less obvious effect on summer Chinook (Table ES.1). Spring Chinook salmon that were detected at Lower Monumental produced from 2% to 36% fewer adults than expected on average, while summer Chinook detected at Lower Monumental produced an average of 2% to 28% fewer adults than expected from other inriver fish, depending on where else the smolts were detected downstream. Steelhead detected at Lower Monumental produced from 11% to 41% fewer adults than expected." There is also information indicating that spillway passage may return more adults than collection and transportation from Lower Monumental Dam. NOAA Fisheries in their 2005 Technical Memorandum on the Effects of the Federal Columbia River Power System on Salmonid Populations concluded that "Wild and hatchery spring-run Chinook salmon transported from Lower Monumental Dam have had the lowest average post-Bonneville Dam survival. Average in-river survival from Lower Monumental Dam to Bonneville Dam has exceeded this average D, indicating that fish not transported from Lower Monumental Dam had higher average annual SAR than fish transported from the site."

The signed Fish Passage Advisory Committee (FPAC) members believe the preferred spring spill operation at Lower Monumental Dam would continue using the bulk spill pattern at flows less than 60 Kcfs, but switch to the uniform spill pattern above river flows of 60 Kcfs. To-date, the Salmon Managers have twice proposed utilizing the uniform spill pattern at total river flows above 60 Kcfs at Lower Monumental Dam. Both the Fish Passage Plan change Form: 12LMN007 Spill Pattern Change and SOR 2011-02 (asking for a similar operation at Lower Monumental) have been rejected by the Action Agencies. However, the Salmon Managers would like to reiterate that the preferred spill operation at Lower Monumental would be to utilize the uniform spill pattern at total river flows above 60 Kcfs to better meet the intent of RPAs 15 & 29. This recommendation is also consistent with the Independent Scientific Advisory Board's conclusion in their September 16, 2008 Snake River Spill-Transport Review that "spill should be considered the default recommendation rather than simply one of the alternatives."

In summary, the signatory Salmon Managers urge the Action Agencies to fully implement FPP Change Form 12LMN007. We are confident this change will: not cause a significant change in direct survival; reduce delayed mortality; provide better TDG management; and, provide increases in adult returns. The Fish Passage Advisory Committee members signed onto this memorandum believe that the recommendations made in FPP Change Form 12LMN007 should be implemented.

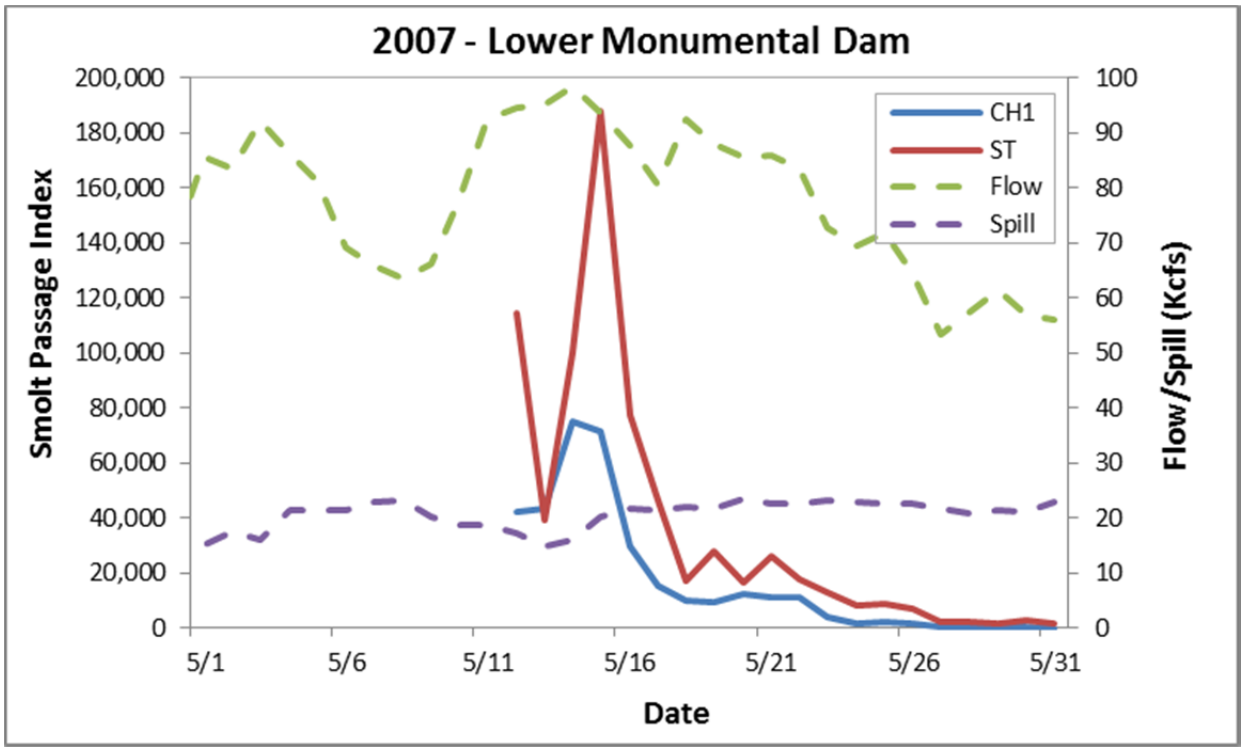

Figure 1. Smolt passage data and flow and spill operations at Lower Monumental Dam, May 1-May 31, 2007. *Full sampling for the Smolt Monitoring Program at LMN did not begin until May 12th sample.*

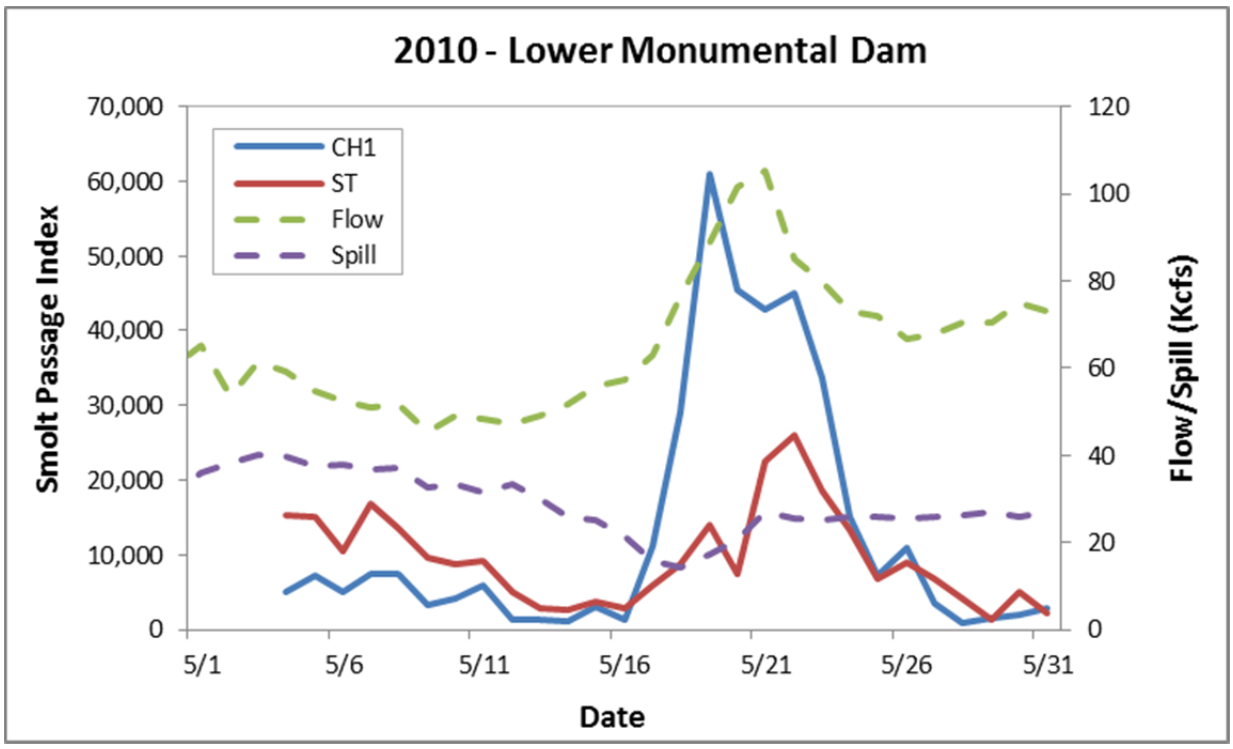

Figure 2. Smolt passage data and flow and spill operations at Lower Monumental Dam, May 1-May 31, 2010. *Full sampling for the Smolt Monitoring Program at LMN did not begin until May 4th sample.*

References:

Buchanan, R., R. Townsend, J. Skalski, K. Hamm. 2010. REPORT: The Effect of Bypass Passage on Adult Returns of Salmon and Steelhead: An Analysis of PIT-Tag Data Using the Program ROSTER.

Hockersmith et al. 2010. Passage Behavior and Survival for Radio-Tagged Yearling Chinook Salmon and Juvenile Steelhead at Lower Monumental Dam, 2009.